



GLOBAL WELLNESS  
INSTITUTE™

# HOT SPRINGS & GEOTHERMAL MINERAL WATERS:

A User's Guide for the  
Global Wellness Traveler



---

# Hot Springs & Geothermal Mineral Waters

---

A User's Guide for the  
Global Wellness Traveler

Ed Moffett  
Amy McDonald



**GLOBAL WELLNESS  
INSTITUTE™**  
EMPOWERING WELLNESS WORLDWIDE

Copyright © 2015 by Global Wellness Institute.

*Hot Springs & Geothermal Mineral Waters: A User's Guide for the Global Wellness Traveler* is the property of the Global Wellness Institute. Quotation of, citation from, and reference to any of the material must be credited to "Global Wellness Institute, *Hot Springs & Geothermal Mineral Waters: A User's Guide for the Global Wellness Traveler*, October 2015." To obtain permission for copying and reproduction, please contact the Global Wellness Institute by email at [research@globalwellnessinstitute.org](mailto:research@globalwellnessinstitute.org) or through [globalwellnessinstitute.org](http://globalwellnessinstitute.org).

# Table of Contents

I. Foreword By Susie Ellis

II. Introduction

III. Hot Springs History and Pre-history

IV. Ancient Hot Springs and Modern Drilled Wells

V. Types of Facilities, Culture and Etiquette

VI. Non-Hot Springs Bathing

VIII. Health Benefits of Hot Springs

IX. Prescriptions for Soaking: Medical Uses for “Taking the Waters”

X. History of Water, Hot Springs and Our DNA

XI. Hot Springs Temperature Range

XII. Why Do Some Hot Springs Smell?

XIII. Unique Biodiversity and Species of Hot Springs

XIV. Hot Springs Sanitation

XV. Before You Go

XVI. Glossary of Terms

---

## About the Global Wellness Institute

The Global Wellness Institute (GWI) is considered the leading global research and educational resource for the global spa and wellness industry and is known for introducing major industry initiatives and regional events that bring together leaders and visionaries to chart the future of the industry. GWI positively impacts global health and wellness by advocating for both public institutions and businesses that are working to help prevent disease, reduce stress, and enhance overall quality of life.

## About the Authors

### Author

Ed Moffett, Co-Founder and Principal, Under a Tree Health and Wellness Consulting, United States, and Co-Chair of 2015 Hot Springs Initiative

### Co Author/Editor

Amy McDonald, Founder and Principal, Under a Tree Health and Wellness Consulting, United States, and Chair of 2015 Hot Springs Initiative

### Contributors

Bonnie Baker, Co-Founder of Sattveva Spa and Wellness Concepts, Mexico

Anne Bramham, President & Founder, American Spa Therapy Education Certification Council (ASTECC), United States

Charles Davidson, Founder & Owner, Peninsula Hot Springs, Australia

Prof. J. Paul De Vierville, Owner & Director, Spa Cultures, United States

Mark Hennebry, Board Director for Danubius Hotel Group, United Kingdom

Diana Mestre, Spa Consultant, Mestre & Mestre, Mexico

Marion Schneider, CEO and Co-Owner, Toskanaworld GMBH, Germany

James White, Hot Springs Research and Development, James D White Ltd, New Zealand

This guide was written by the above listed parties as part of the Global Wellness Institute's, Hot Springs Initiative. It is meant as a general educational guide for hot springs enthusiasts and not meant as a definitive or exhaustive treatise on everything related to natural hot springs or geo thermal waters.

---

# Foreword

Since the beginning of civilization, humans have sought out naturally occurring geothermal mineral waters, or hot springs, for bathing, healing, socializing and for spiritual reasons. The powerful human connection to hot springs is global and historic; however, it was in the 20th century that their popularity waned throughout some regions of the world as there was a heavier focus on modern medicine. In the 21st century, there has been a powerful resurgence of interest in hot springs. Not only because of people's endless hunger for authentic, natural and "hyper-local" experiences, but because the unprecedented pace and strain of modern life has made the stress- and pain-reducing benefits more relevant and urgent.

*Today, hot springs are both an industry and a practice that's really heating up.*

In 2013, what is now known as the Global Wellness Institute, embarked on the first economic study of the global hot springs market. It was a difficult undertaking, as the industry was – and still is – extremely fragmented, and this first attempt at aggregating data from so many countries around the world was further complicated by the fact that every nation (and even regions within nations) had their own vocabulary and standards around the usage of hot springs – with the "waters" described and evaluated in many different ways.

But when the Global Wellness Institute released this yearlong research report in 2014, the results were staggering. One of the report's key findings was there are over 26,000 hot springs establishments across 103 countries that developed recreational and therapeutic facilities and services. Collectively, the global hot springs industry was worth more than \$50 billion in 2013 alone – and that was considered a conservative estimate.

It was in just the last couple of years that professionals in the hot springs industry across the globe began organizing and sharing knowledge – even between established associations and organizations. A global collaborative gathering of hot springs proprietors took place at the 2012 Global Wellness Summit in New Delhi, India – not with an intention to form any kind of governing body, but merely to function as a hub where everyone would be welcomed and ideas could be exchanged that would benefit the entire industry globally. This passionate global group grew even larger and more organized when the Hot Springs Forum

reconvened at the Summit in Marrakesh, Morocco the following year. They eventually became an Initiative of the Global Wellness Institute, and continue to meet and address issues whose resolutions benefit all.

In the past year, the Initiative's chair, Amy McDonald, and her task force members decided that what was needed was a "user's guide" that would help wellness travelers grasp the value of, and more specifically learn facts about, participating in hot springs bathing. They saw a global increase in the word "thermal" being applied to spas without clarification of whether it was natural hot springs or minerals added to tap water. They felt that this was an important clarification, or differentiation, for both hot spring business owners and consumers to understand.

This fueled the decision to create the user's guide that you hold in your hand (or are reading electronically) today, which includes critical information ranging from what sets natural hot springs apart to how important sustainable practices are around these valuable resources, to the clearing up of some widespread global confusion about the difference between natural geothermal mineral water and facilities that offer heated (and/or minerals added) water experiences and use the word "thermal."

I'm delighted that we now have this guide: that the collaborative work between so many people of various continents and backgrounds made it possible, and that it will be introduced at the 2015 Global Wellness Summit in Mexico City, Mexico. I thank all the volunteers that contributed, and we can all be grateful for the many discussions and the amount of research that was required to get to a place where there was general agreement on what should be included. This is only the "first edition", so there will be updates and expansions in the future.

It is my honor to introduce you to *Hot Springs & Geothermal Mineral Waters: A User's Guide for the Global Wellness Traveler*. Designed to create a greater understanding and appreciation for our precious resource of geothermal mineral springs, I hope it will help educate the many millions of health-minded travelers and hot springs lovers worldwide.

Susie Ellis

*Chairman and CEO, Global Wellness Institute*



# Hot Springs & Geothermal Mineral Waters:

## A User's Guide for the Global Wellness Traveler

---

### Introduction

The world's first spas — “hot springs” — have been the quest of wellness travelers since the dawn of civilization. The naturally warm, mineral-rich water flowing right out of the ground has soothed aches and pains for millennia. The hypnotic and magical powers of hot springs have inspired healing lore and bathing rituals on every continent.

Each hot spring has a unique spectrum of minerals and other qualities- no two are alike. While all hot springs provide the familiar benefits of bathing, such as blood circulation enhancement and relaxation, the greater power of hot springs is attributed to their minerals and other qualities including texture, alkalinity, odor and flavor. These qualities set hot springs apart from all other waters.

The water from hot springs – called “geothermal mineral water” – is typically formed as rain and snowmelt sinks through cracks and porosities in the ground to collect in underground streams called “aquifers”, which flow near volcanic or other hot underground geology. The hot water dissolves minerals from surrounding rock, and carries those minerals as it emerges on the surface as hot springs.

Natural hot springs are found as geysers, streams, seeps, bogs or steam vents. They occur in mountains, valleys, deserts, and even under polar ice sheets, lakes and oceans. Hot springs may be extremely hot or barely warm; some have strong odors while others are neutral. The water may be salty, bitter, sweet, hard or soft, nutritious for microbes and plants or relatively sterile, even corrosive or toxic to life.

Hot Springs have inspired healing and bathing rituals in a variety of cultures around the world and today one can explore these unique destinations as a way to refresh, revitalize and feel re-connected with the nurturing energies of these places.

Each hot spring is a unique oasis of habitat and species, sometimes as the only source of water in an area, while other times found near streams, lakes or seawater. Other than soaking, hot springs may also be used for drinking, mind/body cleansing, heating of buildings and roads, and electricity generation. Some hot springs facilities combine all of those functions, making them one of the earth's most sustainable and renewable resources.

Today's global wellness traveler can enjoy many types of hot springs from rustic to luxurious, indigenous to modern urban. You can soak for an hour or a day. Hot spring facilities may include a contemplative spa with massage and yoga, family recreation with a water slide, and medical oversight with full lab analytics provided by doctors and often funded by health insurance.

Regional, national and cultural preferences often guide the design of a hot spring facility, and the ways to use the water. However, it's important to know that a hot spring's water may have powerful health benefits, whether it's a water-slide recreational park, a spa, or a medical treatment facility - or just a trickle of hot water running into the ocean. Hot springs water has unique qualities regardless of how it's used by local culture.

## Hot Springs History and Pre-history

Modern history shows hot springs as health and wellness destinations since the dawn of civilization around 5,000 years ago. Before that, our Paleolithic stone-age ancestors used hot springs for at least 40,000 years. Long before that, archaeological evidence reveals our Cro-Magnon and Neanderthal predecessors used hot springs sites for at least 200,000 years. The minerals and warmth provided year-round habitat for countless species of plants and animals through winters, ice ages and global catastrophes. Our predecessors relied on hot springs year-round for hunting and foraging, drinking, easing the body, and harvesting of minerals including salt.

Natural undeveloped hot springs still exist today in undeveloped areas, often in remote wilderness or areas that have challenging terrain and access. Adventurous hikers may build basic pools to contain hot water and diverse systems to air cool or mix with colder water to create a comfortable soaking temperature. Seasonal floods may wash away these basic pools, however humans will rebuild these pools to again immerse in the pleasure and health benefits associated with hot springs bathing.

## Ancient Hot Springs and Modern Drilled Wells

For most of human history, naturally flowing hot springs were the only source of warm water in which to bathe. People used hand tools to dig small pools where they could submerge their body in the mysteriously warm water.

Today, well drilling technology and geologic science enables access to geothermal mineral water from deep aquifers, even several kilometers down, and in areas where natural hot springs have never freely flowed to the surface.

Facilities built on drilled wells are commonly called “hot springs” even though wells are not springs. Some wells produce water that flows to the surface by itself without pumping- called “artesian” flow, while some wells require pumping to lift the water to the surface. Springs naturally flow to the surface without pumps, although many springs are now drilled and pumped to enhance the water flow rate to increase pool bathing capacity. These hot springs are a combination of spring and well.

For ease of discussion, this Guide uses the term “hot springs” for all geothermal mineral water facilities built on either naturally occurring springs, or drilled wells, or combination of spring and well. Although all languages have words to describe both natural springs and wells, the term “hot springs” is challenging to interpret in some languages. A more scientifically accurate term in all translations is “geothermal mineral water”, which for this Guide applies to “hot spring” waters from both springs and wells, regardless of cultural or political criteria.

Differences between “hot springs” and “wells” include:

### **Springs:**

- springs may have historic and pre-historic use by humans
- springs generally have long history of biology and evolution of life
- springs often have unique mineral deposits
- ancient animal migration paths lead to some hot springs for salt or other minerals
- spring aquifers have elaborate underground channels emerging at springs

## **Wells:**

- wells can provide geothermal mineral water in areas where no hot springs occur
- it is important that wells do not deplete the aquifer

Sustainable use of an aquifer depends on how long it takes rainwater to replenish the water that's pulled out. Some aquifers replenish very slowly or not at all; some water is prehistoric, having been underground for thousands of years- similar to oil deposits that don't have access to the surface until a well is drilled, and are non-renewable. Most developed countries have regulations to ensure aquifers are not depleted.

Naturally flowing hot springs are sometimes endangered by over pumping from aquifers for agriculture and urban use. Because aquifers are hidden deep underground, their complex flow and replenishment dynamics are often debated as politics collide with theoretical assumptions and available science. Regional water-laws often rule who can use the water, and for what purposes, especially during drought cycles. Hot springs and any unique species inhabiting them may be disadvantaged by the demands of industry and global population sprawl. For example, poorly understood microbiomes of hot springs have often been destroyed before their potential medicinal benefits were understood. This highlights the ongoing issue of human need versus habitat and resource conservation.

Today's wellness travelers are often conscious of their ecological footprint and the sustainability of resources. Abundant hot mineral water flowing right out of the earth is a sustainable alternative to the resource intensive and often costly methods used to heat tap water for spas and pools. Many hot spring facilities share what they know about their waters, from source-to-bathing. It's often fascinating and educational for people of all ages to learn more about the water they enjoy, including the water's health benefits.

## **Types of Facilities, Culture and Etiquette**

Natural hot springs are probably the very first type of hot-water bathing humans ever experienced, being the first "spas" and original wellness destinations. Cultures throughout the ages have endowed hot springs with magical or spiritual powers for mystical awakening, sacramental drinking, anointing, physical healing and various religious rituals, including baptism.

Today there are many ways to enjoy hot springs with diverse locations and regions offering unique ways of experiencing these waters. Some facilities are designed into natural landscapes for an organic experience, some are fashioned on ancient and modern architecture.

Some hot springs facilities offer a quiet, meditative atmosphere for self-reflection where contemplative inner focus is enabled; some are more social or interactive; and others are for family recreation with waterslides, campgrounds and other complementary activities.

Medical hot springs are popular in some countries, where the water is part of a health cure and some treatments are partially funded or fully funded by insurance companies or national health-care programs. They may offer full medical treatments prescribed by doctors that can include soaking, drinking and resting in hot springs waters and the surrounding environment.

To accommodate cultural and often religious differences, some facilities offer designated areas or days for women, men, and families to bath separately. Some regions have modest clothing requirements relative and appropriate to their culture. While in some regions nudity or clothing-optional is the norm, in other countries this may be strictly forbidden.

Certain regions have long-standing cultural traditions to follow or honor, while others are entirely informal and non-traditional. For the global wellness traveler, it is important to be aware of these traditions since not bathing to cultural practice may be offensive or even illegal. Adhering to the general culture or specific rules regarding length of time in water or type of water unique to that location, is advised. From facilities that are basic to those that are posh and modern, hot springs are a valuable and sustainable resource for everybody, and for the unique species that have evolved in the oasis of hot springs around the world.

## **Non-Hot Springs Bathing**

While some spas or resorts appear to be “hot springs”, many actually use tap quality drinking water that’s been heated. As wonderful as these facilities can be, they do not offer the unique blend of minerals and other properties offered by genuine geothermal mineral water.

“Thermal bathing” in some regions means “geothermal mineral water bathing” using hot springs water, while in other regions it means “warm water bathing” from heated tap water as found in any hotel or spa. It’s important to know that some “thermal bathing” facilities appear to be hot springs, but may actually be heated municipal water. Some spas add minerals to heated city water to provide some of the benefit of hot springs when the real thing is not available.

Often facilities use heat exchangers to heat water from wells drilled into a dry earth well deep enough to access the natural underground heat of the Earth, bringing that heat to the surface with fluids and transferring the heat to municipal water. While this is appropriately called “geothermal” heat and is usually a sustainable way to heat water, it should not be confused with hot springs or geothermal mineral water, as it lacks both the minerals and the underground journey through the aquifer. It’s a mechanical way to heat the water.

Both genuine and non-hot-springs facilities include using pools of ocean water for soaking, applying muds, clays and peat mixtures, and absorbing minerals from certain sources such as The Dead Sea. Therefore it is important to ask a facility about the origins of its waters. Many people use Epsom salt in their home baths, which is magnesium sulfate, commonly found in hot springs waters.

## Health Benefits of Hot Springs

Nearly all hot springs facilities can provide health benefits derived from their unique mineral waters. Robust medical research, particularly in Europe has proved the benefit of hot springs waters for specific ailments often referred to as “cures”. Some cures are directly related to trace minerals or major concentrations of macro minerals, many of which are directly absorbed through the skin and then circulated through the body as they are incorporated into body tissues. Other cures are related to temperature, viscosity, alkalinity or other properties of the water.

Throughout history people have reported “cures” of various ailments and have had a general boost in health and vitality from soaking in the waters. “Feeling better” is difficult to quantify scientifically, but it is evident that humans throughout history have been feeling better from bathing in hot springs. Often many visitors to these waters believe them to be healing in an organic or spiritual way.

Muds and algae of some hot springs may be used as body scrubs or masque spa treatments, with benefits often coming from the minerals and the unique microbiome of species in the products.

Certain cold-water springs often have many of the properties of geothermal mineral water as often the water was very hot underground but cooled on its way to the surface, retaining much of the dissolved mineral content. Health claims for cold water springs usually relate to drinking water, since it’s too cool for soaking. This water is often bottled and shipped globally.

Ancient humans generally relied on their senses and local lore to understand the health merits of a hot springs, the same process used to discern medicinal and nutritious plants throughout history. Modern technological analysis can supplement and validate the ancient lore while providing additional levels of knowledge that expand the story of water.

Of course, not all hot springs waters are healthful or nutritious- some contain harmful levels of elements such as arsenic or fluoride. Some minerals are beneficial in small amounts but hazardous if consumed copiously. Some hot springs facilities provide detailed laboratory analysis of their water chemistry, along with recommendations for bathing and drinking.

## **Prescriptions for Soaking: Medical Uses for “Taking the Waters”**

Some regions and countries emphasize the medical and medicinal benefits of their hot springs. Government health care and insurance companies send patients to hot springs for prescription “cures”, often prescribed by medical staff. Each spring is unique so the prescriptions vary according to water temperature, mineral content and the medical condition being treated. Prescriptions often include rest, massage, and treatments such as physiotherapy, electrotherapy, hydrotherapy, inhalation and specific diets.

Waters are sometimes taken home for drinking or skin application. Some waters are bottled and shipped all over the world, often sold as “mineral supplements”, rather than as “drinking water”, since the mineral content often exceeds what is allowed by municipal regulations. Other take-home products include various muds, peat, salts, or encapsulated extracts of the hot springs or algae.

“Contrast bathing” may involve going from hot to cold pools in a prescribed sequence for various health benefits, along with rest, massage or specific dietary regimen.

Some facilities may have detailed prescriptions for bathing, for example: 10 minutes in a very hot tub followed by 1 minute in an ice plunge to stimulate the immune response. Other locations may favor a “do-it-yourself” free-form soaking experience, with an array of pools and temperatures available.

## History of Water, Hot Springs and Our DNA

Each water molecule is literally billions of years old. Planetary science tells us that every drop of water arrived on Earth from comets and asteroids since the early formation of our solar system. Each and every drop of water has already passed through the bodies of millions of creatures and life forms.

The evolution of our DNA, and of all species, is inseparable from the hot springs journey of the water itself. With at least 2/3 of our body composed of water, and at least 6% of our body composed of minerals derived from the water, we are in fact part hot springs. Perhaps this explains why soaking in hot springs often feels like “going home”.

Hot springs are a significant part of our planetary habitat and water cycle. They have fueled unique mineral-rich evolutionary habitats for the past 4 billion years. Each hot spring has its own spectra of minerals, temperature and other qualities that enable unique species to evolve and thrive. Entire ecosystems exist at hot springs sites under cold oceans and polar ice sheets.

## Hot Springs Temperature Range

Some hot springs emerge from the ground at the perfect temperature for human bathing. Others are either too hot or barely warm, so they're cooled or heated by non-natural means for human use.

Water temperature is easily described as “hot, warm, tepid and cold”. The temperature of a baby's bath is probably good for long-term soaking, while very hot or ice-cold water is only good for a quick dip. The word “hot” can mean many different degrees of temperature, which varies from culture to culture.

Human bodies tolerate a narrow range of water temperature for bathing. A generally comfortable range is between just below body temperature of 36°C (98°F) to a high of 41°C (106°F).

## Why Do Some Hot Springs Smell?

Some geothermal mineral waters contain ingredients with strong characteristic tastes and odors including: hydrogen sulfide gas (the classic “rotten egg” smell), iron, salt, magnesium, copper



and other compounds. These odors and flavors relate to the unique composition of each source. Certain species in the micro biome may also contribute to distinct odors or flavors, especially as they decompose.

As with wine and plant essence aficionados, a hot springs connoisseur may be able to identify subtle odor and essences in water samples and discern various minerals and even the source of the water. Some scents or flavors may not taste good, and yet are healthful medicines, as with plant alkaloids. The taste or smell may or may not indicate its importance for certain healthful uses.

## Unique Biodiversity and Species of Hot Springs

Many unique species have evolved to inhabit certain springs, including aquatic plants, algae, fungi, fish, crustaceans, amphibians and insects. Some of these are extremophiles, meaning they tolerate extreme environments such as heat and high mineral concentrations. One classic example is the Julimes Pupfish that lives in a single Mexican hot springs location, with temperatures up to 45°C/114°F, along with a hot water snail and the various algae they eat. That temperature is far too hot for most humans to tolerate and very few organisms can survive in such hot water.

Green and blue-green colonies of single-celled photosynthetic plants thrive in mineral-rich waters and are often used as scrubs and masks for the body and skin. Muds, peats and surrounding soils are also used for body treatments, each with their own complex of microbiome species unique to that hot spring.

The genetic repertoire of these “hot spring specific species” offers a peek into how adaptation can occur within challenging concentrations of minerals. Conservation of these species is critical to maintain their genetic diversity and future benefit to science and medicine. Encroaching developments and aquifer threats have led to closure of some hot springs to protect threatened species from extinction.

## Hot Springs Sanitation

Like all public bathing waters, hot springs must be monitored for pathogens that could cause disease, such as E. coli and PAM amoeba. Some facilities have sufficient water flow that no sanitizing chemicals are needed, and the pure water and minerals are ideal for bathing. Other

facilities drain and clean the pools each day. Many others do require sanitizing chemicals or treatments to maintain healthful water quality.

Although hot springs connoisseurs generally prefer non-sanitized hot springs, if required, most people agree that the chemicals are of less concern than illness caused by pathogens. Most “hot springs” facilities, spas and resorts are carefully managed for water quality and regional governments usually play a role in the sanitization management.

Most facilities recommend washing prior to soaking to avoid contamination of the water by both human debris and body products including deodorants, lotions, oils and sunscreens. Wilderness hot springs sometimes have signs warning of various water-borne pathogens, aquatic insects or hazardous elements in the water, in addition to biting insects, spiders and mites in the surrounding vegetation of the oasis. Many species flourish at hot springs sites as they have for millions of years, so we human newcomers must be alert in our quest for a good soak.

## **Before You Go**

Global wellness travelers are wise to ask about the source of hot springs water, and most facilities have excellent information about their waters. Be sure to inquire ahead of time regarding clothing and bathing protocols as some countries require specific clothing, some segregate women and men, and others are clothing-optional or no clothing allowed. Some facilities encourage silence in pool areas to allow a meditative atmosphere, while others are more social and interactive.

Generally, it's good etiquette to bathe or rinse before entering a public hot springs to keep lotions, oils, scents and sunscreen out of the shared water. The natural scent of the water adds to its healthful effects.

# Glossary of Terms

(Alphabetical Order)

## Some hot springs terms of interest:

- Algae - an informal term for a large and diverse group of simple organisms of aquatic or moist habitats
- Aquifer - an underground layer of water bearing, permeable rock
- Balneology- is the scientific research and therapeutic practice of using mineral and thermal mineral waters, as well as natural gases and peloids (muds), through bathing, steaming, drinking and inhalation
- Contrast Bathing - a form of treatment where a limb or the entire body is immersed in ice water followed by the immediate immersion of the limb or body in warm water
- Extremophiles - an organism that thrives in physically or geochemically extreme environments
- Geothermal - energy, generated and stored in the Earth that determines the temperature of matter
- Geothermal Mineral Water - water flowing from hot springs
- Goldilocks zone - the natural, ideal hot springs temperature
- Ground Source Loop Heat Exchange - drilling a dry well deep enough to access the natural underground heat of the Earth, bringing that heat to the surface with fluids and transferring the heat to municipal water
- Halophyte - a saline-tolerant plant species
- Hot Springs - for our purposes, geothermal mineral water facilities whether they're naturally occurring hot springs or modern drilled wells, or a combination of both spring and well

- Hydrologic - the scientific study of the movement, distribution, and quality of water on Earth and other planets
- Hydrotherapy - the use of water for pain relief and treatment
- Microbiomes - the microorganisms in a particular environment
- Mineral - a mineral is a naturally occurring substance that is solid and inorganic and has an ordered atomic structure
- Mud - for our purposes, wet, soft earth or earthy matter occurring in or around hot springs
- Peloid is mud, or clay used therapeutically, as part of balneotherapy, or therapeutic bathing. Peloids consist of humus and minerals formed over many years by geological and biological, chemical and physical processes
- Peat - a brown, soil-like material characteristic of boggy, acid ground, consisting of partly decomposed vegetable matter
- Primordial – ancient, prehistoric, from the beginning
- Thermal spa; THERMAL, THERMAE The word “thermal” often implies “geothermal”, although in some facilities its used to mean “warm water for bathing”. Most places that call themselves “thermal” are actually using geothermal mineral waters
- Replenish rate - the rate at which an aquifer’s water is naturally replaced
- Sauna - a small room or building designed as a place to experience dry or wet heat sessions
- Spa and resort spa - for our purposes, a location where a hot springs exists
- Sweat lodge, volcanic vent, geyser heat therapies
- Thalasso - the medical use of seawater as a form of therapy
- Thermoludism - combines the virtues of hydrotherapy with different water games and related activities (relaxation areas, wellness activities etc...) of a fun nature thereby offering a modern form of hydrotherapy





**GLOBAL WELLNESS  
INSTITUTE™**  
EMPOWERING WELLNESS WORLDWIDE

[www.globalwellnessinstitute.org](http://www.globalwellnessinstitute.org)

---

Copyright © 2015 by Global Wellness Institute.

*Hot Springs & Geothermal Mineral Waters: A User's Guide for the Global Wellness Traveler* is the property of the Global Wellness Institute. Quotation of, citation from, and reference to any of the material must be credited to "Global Wellness Institute, *Hot Springs & Geothermal Mineral Waters: A User's Guide for the Global Wellness Traveler*, October 2015." To obtain permission for copying and reproduction, please contact the Global Wellness Institute by email at [research@globalwellnessinstitute.org](mailto:research@globalwellnessinstitute.org) or through [globalwellnessinstitute.org](http://globalwellnessinstitute.org).

---