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Former gas stations in Timișoara area – Inventory and analysis of recognised environmental conditions

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Abstract

In urban areas, gas stations can be classified as some of the most widespread hazardous locations. This is due to the flammable or explosive potential of the products sold here, such as gasoline, diesel, and LPG, and the impact of handling hazardous substances on the environment and public health. Closing a gas station without taking all necessary minimum measures poses a potential hazard to the surrounding environment and the population's health and safety. The present study identifies the sites of former fuel distribution stations and liquefied petroleum gas (LPG) refuelling stations in Timișoara. All publicly available information regarding their recognised environmental conditions (RECs) was analysed. Google Maps or Google Earth images were used to confirm the presence of fuel distribution or LPG activities at these locations. Nine non-functional gas stations and LPG stations were identified, some of which have long been disused with minimal physical evidence of their economic activity, while others were more recently closed but still retain their facilities or associated buildings on-site. A detailed assessment of the environmental conditions was conducted for six of these locations.
Keywords: *gas station, decommissioned gas station, brownfield, environmental conflict, recognised environmental conditions (RECs)*

Introduction

Gas stations, also known as fuel or petrol stations, consist of equipment for fuel distribution, storage tanks, and additional buildings such as restaurants, small shops, car washes, and LPG installations (Order 174/2005). Gas stations are economic service units that might harm environmental aspects, especially when they do not comply with legal requirements (Iojă et al., 2015). A gas station is considered a small-scale industrial site (Pîndaru et al., 2021; Zhu et al., 2024). To some degree, the gas stations are among the most commounly found hazardous locations in urban areas (Mäkká et al., 2021). Therefore, a gas station must adhere to specific operating rules to ensure smooth operations and avoid endangering the population or nearby property. Spatial planning must prioritize human safety (Gbola Kehinde, 2020), particulary in urban areas where the gas stations are prevalent, population density is high and other industrial sites may be located in the vicinity of such activities.

To legally operate a gas station, the economic operator must obtain several permits and approvals that require periodic review and renewal following the regulations in force. For example, an environmental permit requires the gas station operator to fully comply with provisions from relevant legal acts, including subsequent modifications and amendments. Examples of such acts include Government Emergency Ordinance (OUG) 195/2005 on environmental protection, Law 104/2011 on ambient air quality, Government Decision (HG) 856/2002 on waste management records, Law 264/2017 on volatile organic compounds (VOC), and other regulations related to environmental quality and safety of on-site installations. Order 174/2005 establishes technical regulations for designing, constructing, operating, and decommissioning the gas stations. Key components include fuel storage, discharge tanks, pumps, hydrocarbon separators, roads, parking, and utilities. The order also mandates safe distances between gas stations and the nearby structures, especially for fire or explosion risks. Stations with LPG facilities must follow specific standards (NP 037-99). Romanian law requires new stations to be at least 15 meters from residential windows to minimize health risks and discomfort.

Gas station operators face strict under the mentioned legislation, requirering them to prevent environmental damage and through dedicated preventive measures and address any damage with corrective actions (Chaiklieng, 2021; Mäkká et al., 2021, 2024). These requirements stem from existing experience and the anticipation of potential failure scenarious in gas stations operation and human behaviour.

Furthermore, authorities periodically request various air or wastewater measurements to verify compliance with existing legislation (Trnka, 2020; Yang, 2020). These requirements are stipulated in the permits issued by the competent authorities. Organisations adapt to environmenal risks by developing responses to the actual or anticipated impacts of various factors that can lead to

environmental hazards (Lennon et al., 2024; Li et al., 2024). The lack of adequate regulations or the inadequate implementation of existing ones leads to significant urban planning problems (Amoako et al., 2022; Batambock et al., 2021). A gas station that operates improperly or is located near activities that could disrupt normal site operations is, by definition, a potential hazard (Amoako et al., 2022; Mohsin et al., 2022; Yu et al., 2023). If the provisions of the permits are not adhered to, the gas station owner, as the permit holder, is typically sanctioned according to the current legal requirements.

Abandoned gas stations = environmental conflicts

Typically, polluting facilities or those posing a technogenic risk are situated in areas where resistance from residents is minimal. The environmental conflict arises more from the desire to avoid the negative impact of specific projects than from the intention to protect the urban environment (Humphreys & Walmsley, 1991). Gas stations are strategically located for easy access and are easily recognisable to customers through colour codes, logos, and personalised signs (Jakle & Sculle, 2011). Customers often choose a gas station based on traffic flow, preferring the stations along their route or the nearest station to their home (Nicholas, 2010). Fuel quality and price are also important considerations for clients. When a gas station is no longer profitable or fails to comply with existing legal requirements, usually it is closed, and the land becomes available for redevelopment. Sites where gas stations once operated and which have not been redeveloped are classified as brownfields, i.e., "properties where expansion, redevelopment, or reuse may be complicated due to the presence or potential presence of hazardous substances" (US EPA). Former, abandoned gas stations are a type of disused land where petroleum represents the contaminant that can impact the environment, especially the soil and groundwater. This means that any contaminant that might be found on the site needs to be removed, and eliminated from the location.

Research indicated that gas stations are often linked to increased crime (Boehme et al., 2022, Sundquist et al., 2025). The brownfield status of a site can lead to conflicts when nearby residents or other stakeholders become aware of the potential hazard, or when the site becomes attractive to homeless individuals, criminal groups, or for illegal waste dumping. Environmental conflicts arising from different views held by involved stakeholders are caused by functional incompatibilities (Daniels & Walker, 2001; Iojă et al., 2015). Therefore, an environmental conflict is closely related to land use (Hanaček & Rodríguez-Labajos, 2018) and the perception of residents regarding that use. When a gas station closes without the site being restored to its initial state or transformed into one that does not harm the citizens, opposition from residents can arise against the site owners and the authorities that allowed the brownfield status of that location. The conflict arises because people feel powerless and incapable of eliminating environmental degradation or any other negative impact activity that exists near their homes (Lake, 1993). This phenomenon is also known as NIMBY (not in my backyard), characterising the communities' disagreement with certain land uses or unwanted (but necessary) locations in their vicinity, referred to as LULU (locally unwanted land uses) due to the adverse effects of their function (Schively, 2007). Gas and LPG stations could be considered LULUs due to the flammable and explosive potential of the products they sell (gasoline, diesel, GPL). Additionally, these sites handle hazardous substances that impact the environment and public health. Stakeholders directly affected by these LULUs are primarily those who live or work nearby, as proximity is a common element in all NIMBY conflicts (Smith, 1981). If there are no directly affected stakeholders, there is no one to raise awareness of the potentially conflicting association.

Study area

In the context of industrial decline or the relocation of industrial functions, a significant part of the land in Timișoara that once hosted these economic activities has remained abandoned. The closure operations either did not comply with environmental requirements imposed by authorities or, at that time, the existing legal requirements did not mandate such actions. The relocation of many economic activities accelerates the creation of a brownfield stock (Rey et al., 2022). In contrast to other nations (such as Germany), which have adopted innovative approaches in brownfield redevelopment (Rey et al., 2022), Romania initiated the regeneration of significant brownfield sites at a later stage. Consequently, there are still areas in cities with significant potential for mitigating urban sprawl.

Many gas stations are situated along major access routes, specifically the European Road E70 (Calea Lugojului - Calea Șagului), European Road E671 (Calea Aradului), and National Road DN6 (Calea Torontalului), where heavy traffic from the city is also present. Out of the 60 identified gas stations, nine sites are former gas stations that still show visible traces of their former activity or are known to have been involved in fuel distribution at some point (Fig. 1). Currently, these sites are either abandoned or have been developed for other projects. Gas stations are typically closed due to various factors, including station profitability or competition for the land on which a gas station is situated. For most of these sites, abandonment followed, rendering them vacant and often unsuitable for development (Guarasci, 1998).

This study aims to: (1) Identify recognised environmental conditions (RECs) as defined by the ASTM E1527-21 Standard for Phase 1 Environmental Site Assessment Reports in relation to abandoned gas station sites in Timișoara, to the extent feasible.; (2) identify other

environmental, social, or health and safety characteristics associated with the abandonment of such sites using public sources; (3) analyse the main causes of the closure of these gas stations and, if such data is publicly available, explore their regeneration.

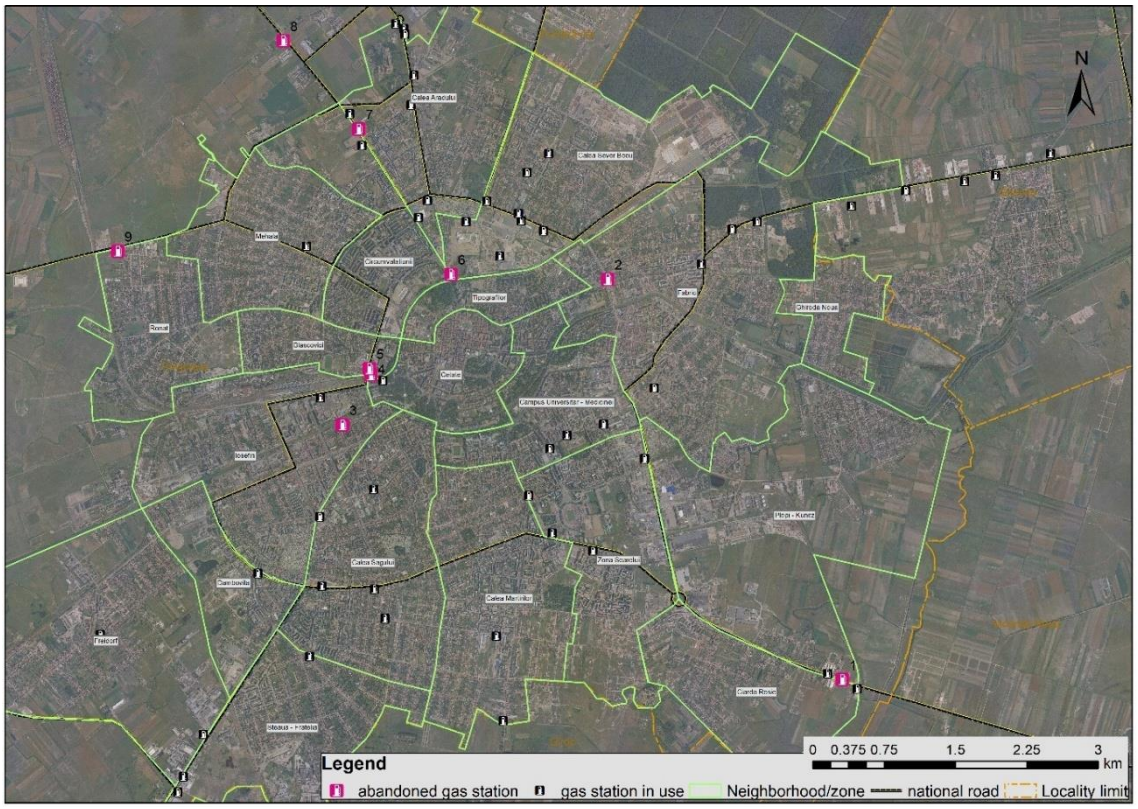

Figure 1: Spatial distribution of gas stations in Timișoara

Methodology

This study presents results obtained through mixed qualitative and field methods. The findings represent the conclusions drawn from the limited use of the ASTM E1527-21 standard (formerly known as the American Society for Testing and Materials) for environmental due diligence assessments, specifically Phase 1 assessments, with necessary adjustments to account for limitations related to the availability of public information regarding land use and environmental conditions in Romania. According to the new standard, a Recognised Environmental Condition (REC) refers to:

1) The presence of hazardous substances or petroleum products on, in, or at a specific property due to a release into the surrounding environment.

2) The likely presence of hazardous substances or petroleum products on, in, or at a specific property due to a release or probable release into the surrounding environment.

3) The presence of hazardous substances or petroleum products on, in, or at a specific property under conditions that pose a significant threat of future release into the surrounding environment (ASTM E1527-21).

Establishing these Recognised Environmental Conditions (RECs) identifies conditions associated with a specific site. Review of existing documentation, site reconnaissance, and interviews with various stakeholders play a role in identifying associated RECs.

Having precise knowledge of the location of each former gas station allows us to have a clear picture of the distance between it and each neighbouring site, depending on its specific use (residential, commercial, etc.). The coordinates of the sites where traces of former gas stations were identified were collected during field visits using a GPS (Garmin) and Google Maps (Douti et al., 2019). We encountered no issues accessing the gas station locations, as all of them were easily accessible from the sidewalk.

An orthophotoplan was used to map all the gas stations in use or the former gas stations. Additionally, georeferenced Google Earth images were used for an updated visualisation of the selected locations. Google Earth provides access to historical images, which represent an important resource for monitoring landscape changes and land use (Lesiv et al., 2018). Google Maps allows its users to quickly locate specific addresses, providing detailed digital maps and high-resolution aerial images (Vandeviver, 2014). Street View, available within

Google Maps, enables three-dimensional visualisation at street level (Vandeviver, 2014). Additionally, data collection through media content analysis (Joerin et al., 2005; Del Romero Renau & Trudelle, 2011; Brown & Raymond, 2013) is a common method in environmental conflict research due to its ease of conveying information to interested parties. Mass media encompasses all forms of information communicated to large groups of people (Kheeshadeh, 2012) through the press, TV, and radio (Morris & Ogan, 1996). Furthermore, historical images from Google Maps and Google Earth have been used to document the use of these respective sites.

Study limitations

The assessment of environmental conditions according to the ASTM E1527-21 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process was limited to specific criteria for which information was publicly available. No interviews were conducted.

Results

Out of the 9 identified locations, it was determined that a former, decommissioned gas station site could be completely decommissioned, with installations, tanks, or buildings being removed and only the asphalt surface remaining or being remodelled. Alternatively, the following installations or buildings can be partially or entirely found on the property:

- Fuel pumps and the pipes connecting the underground tank to the distribution pumps;
- The fuel tank or tanks, usually underground tanks;
- Other containers with fuel, used oil, or other liquids specific to the maintenance of a vehicle;
- Vent pipes – which may contain VOCs;
- Gas station buildings, which may be built with materials hazardous to the environment or the population.

Leakage from underground tanks or during refuelling can lead to environmental contamination, and decommissioned gas stations can attract illegal waste disposal.

The recognised environmental conditions (RECs) for six selected sites were summarised using the methodology proposed by standards applied in environmental due diligence assessments during real estate acquisitions, based on the ASTM E1527-21 Standard for Phase 1 Environmental Site Assessment Reports. During field visits, traces of former gas stations or LPG stations were observed at 4 out of the 6 sites, except for sites 4 and 6, which have been included in private investor projects for several years. A mini-report of findings was prepared based on the accessible information for each subject property/site.

Site 1, Calea Buziașului

The former gas station is located in the urban area of Timișoara, on Calea Buziașului, covering an approximate area of 800 square meters (Fig. 2). According to the Timișoara Urban Planning General Plan (PUG), the site falls within a mixed-use zone, combining residential and service-related functions. The neighbouring land use is diverse, including construction material depots, specialised installation companies, transportation firms, auto parts stores, and auto service centres. Additionally, there are some greenfield areas nearby.

During field visits, the site was found to be a former gas station. Some of the facilities on the premises were decommissioned, while others were completely removed. Unfortunately, based on publicly available information, the period when the gas station was built and put into use has not been identified. Regarding the closure date, an analysis of historical Google Maps images suggests that the gas station ceased operations sometime between August 2018 and October 2019.

No environmental permits have been identified for this site in the public documents on the Environmental Protection Agency (APM) website. The historical information regarding this location consists of Google Maps images dating back to August 2009, which revealed three different fuel providers. The site inspection involved physical observations of the location on May 21, 2023, and September 10, 2023, during field visits (Fig. 3. a, b). Access to the subject property was not directly restricted, however, the site was fenced to prevent unauthorised entry. The fuel distribution pumps were still present at the site during the visit.

No evidence of underground tank removal was found. However, upon comparing on-site images (Fig. 3 c) with Google Maps images (Fig. 2 and Fig. 3 d), it can be inferred that the tanks were most likely removed. Traces of construction materials were also identified, likely resulting from the demolition of buildings on the site.

Figure 2: Former gas station, Calea Buziașului

Figure 3: Site 1 during field visits and on Google Maps

The analysed site presents the following Recognised Environmental Conditions (RECs): there is a potential risk of accidental fuel leaks, various waste, or used oil from equipment or vehicles on the site, as well as from handling other hazardous substances or waste on the premises. A detailed soil investigation could confirm or refute the presence of hydrocarbons.

Site 2, Badea Cârțan Square

This site is situated in the urban area of Timișoara, at the intersection of Simion Bărnuțiu and Mihail Kogălniceanu streets, near Badea Cârțan Square (Fig. 4), covering an approximate area of 500 square meters. According to the old Timișoara Urban Planning General Plan (PUG), the site was categorised as a green space, while the new PUG designates it as a street area. The surrounding area has diverse land uses, including small commercial spaces of various types, such as pharmacies, medical offices, a church, an agro-food market, residential buildings etc. During field visits, the site was found to be a former gas station. Most of the facilities on the premises have been removed. The gas station was operational before 1989 and closed after 1990. Based on publicly available information, it was difficult to determine the exact construction and operational dates of the gas station or the closure date.

No environmental permits have been found for this former gas station in the public documents on the APM website. Historical information about this location includes Google Maps images dating back to July 2011 (Fig. 5 a). Even back then, the space looked abandoned, with evidence of fuel pumps and underground tanks (manhole or manway covers). A site reconnaissance involving physical observations was conducted on October 30, 2022 (Fig. 5 b, c). At the time of the field visit, there were no restrictive conditions related to site access.

The site shows evidence of prior asphalt paving, which has deteriorated over time and is now covered by vegetation or gravel (Fig. 5 a). Additionally, the ruins of the gas station building were identified, which facilitate illegal waste deposition (Fig. 5 c). Evidence of the existence of underground tanks on the site was also found (manhole or manway covers - Fig. 5 b).

Figure 4: Abandoned gas station, Badea Cârțan Square

Figure 5: Site 2 during field visits and on Google Maps

The site is unfenced, and people have created pathways through this site or parked their vehicles in the absence of designated parking areas (Fig. 4). Regarding the subject property, there are Recognised Environmental Conditions (RECs) including the theoretical potential risk of accidental fuel leaks, various waste, or used oil from equipment or vehicles on the site, as well as from handling other hazardous substances or waste on the premises. A detailed soil investigation would be necessary to confirm or refute the presence of hydrocarbons in the soil.

Site 3, Splaiul Tudor Vladimirescu

The site is located within the urban area of Timișoara, on Splaiul Tudor Vladimirescu, with an approximate area of 350 square meters. According to the Timișoara General Urban Plan (PUG), the former gas station is categorised as a public or private recreational zone (Fig. 6). The neighbouring land use is predominantly residential, with insufficiently utilised or abandoned recreational spaces.

During the site visits, it was identified that the subject property used to be a gas station, and part of the installations had been removed. Based on the publicly available information, the exact construction date, date when the gas station became operational or the closure date could not be determined. However, based on Google Maps images, the gas station was still operational in August 2014 (Fig. 7 a).

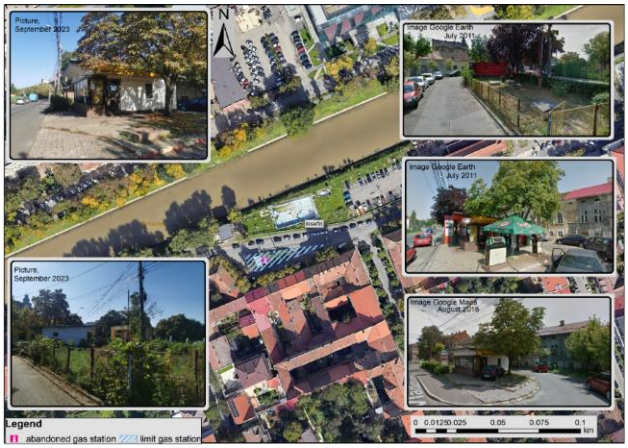

Figure 6: Abandoned gas station, Splaiul Tudor Vladimirescu

There are no environmental permits for this location in the public documents from the APM website. The only historical information that could be accessed about this site is from Google Maps images dating back to July 2011, which indicate that the space appeared abandoned, with evidence of fuel pumps and covered underground tanks.

Figure 7: Site 3 during field visits and on Google Maps

Physical observations of the site were conducted on 03.07.2022 and 10.09.2023 (Fig. 7 b-e). During the field visits, there were no restrictions on accessing the site. It was observed that the two pumps had been removed (Fig. 7 e). The gas station building was well-preserved, but it had been abandoned and attracted street artists who left graffiti-type signatures (Fig. 7 b, d). Evidence of underground reservoirs (manhole or manway covers) was found on the site (Fig. 7 d). The site is well-fenced off, limiting public access (Fig. 7 c).

Regarding the subject property, there are several RECs to highlight. Firstly, there is a theoretical potential risk of accidental fuel leaks, along with the possibility of various waste or used oil from equipment or vehicles on the site. Additionally, hazardous substances or waste might be handled on the premises. A comprehensive soil investigation could confirm or disprove the presence of hydrocarbons.

Site 4, Site 5, Calea Circumvalațiunii

The two sites are situated within the urban area of Timișoara, on Calea Circumvalațiunii (Fig. 8), with an approximate area of 6500 square meters and 3000 square meters, respectively. According to the Timișoara General Urban Plan (PUG), the subject properties are located in an area designated for redevelopment of industrial sites, allowing mixed functions: residential, services, and commercial use. The surrounding land use includes service areas (i.e., offices), residential buildings and commercial spaces. Furthermore, former industrial sites that have been restructured and are mostly cleared can be found. The Caransebeș-Timișoara-Arad railway line and its associated buffer zone are situated along the southern part of site #4.

Figure 8: Abandoned gas stations, Calea Circumvalațiunii

During the site visits, it was found that the former deposit and station for gaseous fuel #4 had been replaced by the Incuboxx building (Fig. 10 c), which now serves as a business incubator. Site #5 was occupied by a former gas station, which most of the installations were removed from (Fig. 10 c, d). Unfortunately, the exact construction date, or dates when the gas station was built or became operational, could not be determined, nor was there information on its closure date. However, according to the

general Memorandum of the mixed real estate project's Urban Planning Zoning (PUZ), the gas station was decommissioned in 2014.

No environmental permits have been identified for the two locations in the public documents on the APM website. Historical information regarding these sites consists of Google Maps images dating back to August/September 2009 (Fig. 9 a, Fig. 10 a). It can be observed that both locations were in use in 2009, but by 2011, Site 4 was already decommissioned (Fig. 9 b).

Figure 9: Site 4 and 5 on Google Maps

Figure 10: Site 5 during the site visits and on Google Maps

Based on Google Maps images, the gas station (site #5) was still operational in August 2014 (Fig. 10 b), indicating that closure occurred after that date. An image from August 2018 (Fig. 9 c) confirms that the location was abandoned and put up for sale.

Regarding the subject property #5, the Timișoara City Hall website has been informing and consulting the public about the development or revision of territorial and urban planning through Urban Planning Zoning (PUZ). There are no public documents to prove that environmental due diligence assessments, including soil or groundwater sampling for pollution analysis, were conducted for the new construction on site #4. Similarly, no such documents have been identified for site #5. The site recognition consisted of physical observations of the subject properties on August 31, 2021 (Fig. 10 c), and July 12, 2023 (Fig. 10 d). During the field visits, there were no restrictions related to access to the site. During the initial site visit (Fig. 10 c)), the pumps had already been removed from the subject property, and during the second visit there was evidence that the underground tanks were excavated (Fig. 10 d). A Google image from July 2023 (Fig. 9 d) confirms that the entire building has been demolished, and the access space to the gas station was used as a parking area at that time.

Regarding these two sites, the following RECs can be highlighted: a theoretical, potential risk of accidental fuel leaks, various waste, or used oil from equipment or vehicles on both sites or from handling other hazardous substances or waste on the site. Also, a detailed soil investigation could confirm or refute the presence of hydrocarbons.

Site 6, Calea Aradului

The site is situated within the urban area of Timișoara, on Calea Aradului, in the vicinity of Iulius Town recreational space, covering an area of approximately 2400 square meters (Fig. 11). According to the Timișoara Urban General Plan (PUG), the site is located in a functional service area. The neighbouring land use is mixed, including green spaces, office areas, a railway, and a residential complex built on a former industrial site.

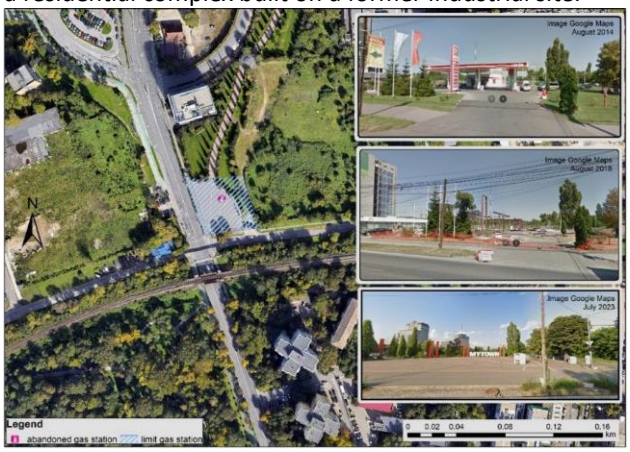

Figure 11: Former gas station, Calea Aradului

During the field visits, the site had been either paved over or turned into green space as part of a real estate development project (Fig. 12). No evidence of any gas station was identified on this site. Based on available information, neither the construction or commissioning dates of the gas station nor the date of its closure could be identified. However, in August 2018, the site was mostly demolished (Fig. 11). Public documents on the APM website do not indicate any environmental permits for this site. Historical information about this location consists of Google Maps images dating back to August 2014, when the gas station was still operating (Fig. 11).

Figure 12: Site 6 during the visit in August 2021

Physical observations of the location were conducted in August 2021, with no restrictions regarding access to the property during the field visit. The site does not show any evidence of a gas station being present. The following Recognised Environmental Conditions RECs are noteworthy for this site: there is no visible evidence of a risk related to accidental fuel or used oil leaks. However, a detailed soil investigation could confirm or refute the presence of hydrocarbons resulting from the operation or removal of the gas station.

Discussions

In Romania, the deindustrialisation that took place after the communist period led to the disappearance of some environmental conflicts due to changes in land use (Onose et al., 2015) or created new conflicts. Industrial facilities were converted into commercial, office, or residential spaces (Onose et al., 2015), while some sites remain abandoned, providing potential land for new urban functions (Chelcea, 2008). However, former gas stations in Timișoara may pose environmental risks due to possible contamination from abandonment and lack of maintenance. Non-compliance with the closure and restoration plans specified in environmental permits during the cessation of impactful activities can have significant consequences for the environment and public health.

Based on field-collected information, former gas stations could be classified into the following categories:

- Former gas stations, which have gone through a redevelopment process, or are currently included in a redevelopment project. Such sites have been repurposed as green areas or office buildings, or are being turned into mixed-use spaces, including commercial, office, and residential buildings.

- Former gas stations that have been abandoned but still show signs of past activity, with no evidence of future changes. The extent of deterioration of these sites depends on how long the gas stations have been closed and the existence of any new development plans in place.

Similar to large industrial companies, various stakeholders took advantage of the privatisation trend, speculating on the profit they could gain solely from selling the land where certain gas stations were located. This is also the case with the former gas station on Badea Cârțan Square (Site 2). Table 1 includes information identified in the local press regarding real estate speculation related to Site 2, where a former gas station can be found.

As evident, Site 2 serves as an example of a failed real estate transaction for development. The location, depicted in Figures 4-5, still shows remnants of the former gas station, and the associated building is an attractive space for homeless individuals or illegal waste dumping. In contrast, Site 3 (Fig. 6-7) is fenced, with the building showing minimal degradation (only the walls covered in graffiti), and the green space is well-maintained. The land beneath these sites potentially contains contamination from seepage originating from underground reservoirs and surface spillways, requiring measures to remove contaminants before any development takes place. Despite not being aesthetically pleasing, these properties do not appear to be disliked by the population.

spillways, requiring measures to remove contaminants before any development takes place. Despite not being aesthetically pleasing, these properties do not appear to be disliked by the population.

Revitalising brownfield sites has the potential to reduce urban sprawl and enhance the attractiveness of an area, especially when residential areas are nearby. This process includes revitalising areas that have lost their appeal and economic importance, as well as addressing any necessary land decontamination. In 2001-2002, the US EPA granted up to $100,000, totalling approximately $5 million, to assess and decontaminate abandoned oil sites. This initiative led to partnerships aimed at repurposing abandoned gas stations. The Brownfields Act (2002) authorised the EPA to provide financial support for inventorying, assessing, and cleaning up contaminated areas with petroleum products. The EPA's financial assistance continued in 2003 and 2004. Through partnerships with states, local communities, and the private sector, the EPA not only remediated specific sites but also contributed to the development of housing, public health buildings, parks, wetlands, and new businesses. In the United States, federal grants are given through the EPA Brownfields Program to assess and clean up sites where expansion, redevelopment, or reuse may

be complicated due to the presence of hazardous substances. There are also local programs at the state level and private sector-funded initiatives (Haninger et al., 2017).

Table 1: Information from media on real estate speculation related to former gas station sites

Site	Information	News title	Date
A former gas station, Badea Cârțan Square (Site 2)	The abandoned gas station is considered an unsafe location, frequented by homeless individuals, and has become an unofficial public restroom and an illegal waste dump. Discussions also focus on the station's age, dating back to the communist period.	A phantom building scares passersby in Badea Cârțan Square	June 2, 2017
	A newspaper article has highlighted difficulties in sanctioning the site owner due to its deteriorated condition.	Difficult to demolish: 7 Fines for the former BkP gas station in Badea Cârțan Square	February 27, 2014
	The site was sold in an auction by the National Tax Administration Agency (ANAF).	The former gas station in Badea Cartan Square, Timișoara, was part of the Marian Iancu case and was sold	August 26, 2016

Although former gas station sites are not suitable for large-scale projects, they can be transformed into spaces for restaurants, community centres, or small parks (pocket parks). Furthermore, these properties can also be developed alongside adjacent lands for larger projects, as seen with Site 6 (Fig. 11-12). Creating green areas would benefit nearby residents and the environment.

Conclusions

Ceasing or closing gas stations without implementing essential precautions can pose a potential threat to the environment and public health and safety. The cessation of economic activity can significantly affect the future development of an area, potentially influencing how the space is subsequently utilised. If closure occurs without adhering to the limitations and conditions specified in the environmental permit, the affected land (and beyond) may face contamination problems or pose risks to public health and safety. As a result of limited public data available on the closure of certain gas stations, a thorough analysis of all the information related to Recognised Environmental Conditions (RECs) associated with these sites, as defined by the ASTM E1527-21 Standard for Phase 1 Environmental Site Assessment Reports, including subsequent modifications, has been conducted.

Considering that the abandonment of industrial sites is a common occurrence in the municipality of Timișoara, and a gas station is essentially a small-scale industrial site (Pîndaru et al., 2021), a question may arise: "What options do residents living near a former gas station have when the site is abandoned and becomes a brownfield?" In practical terms, the potential environmental impact shifts as the risks associated with a functioning gas station change. The site now becomes more attractive to homeless individuals, criminal groups, and illegal waste dumping.

Bearing in mind their historical use, the sites where gas stations once functioned can be deemed unsafe for residents living or working in their vicinity due to potential pollution that occurred during the gas station's operation or after its closure. Ideally, there are almost always stakeholders who raise awareness regarding various projects or activities that can have environmental consequences. However, some environmental issues only capture citizens' attention if they believe they are directly impacted by the problem. Protective attitudes and opposition tactics adopted by community groups facing unwanted development (Dear, 1982) demonstrate how residents seek to safeguard their surroundings from undesirable changes nearby.

Opposition to specific activities or projects by certain stakeholders is a relatively new topic in Romania. In the past, project development occurred without public consultation. However, current authorisation processes involve public consultation, aligning Romanian legislation with EU standards regarding public input on project development. Companies must follow these procedures to avoid any "Not In My Backyard" (NIMBY) conflicts. This trend is evident in public consultation reports, where citizens are invited to express their opinions on new projects. However, citizen engagement in Timișoara remains limited. Most often, residents' opinions are subjective and influenced by cultural heritage, specific policies, or even their level of understanding (often limited) regarding the proposed project.

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Author contribution

The first draft of the manuscript was written by R.V. and M.V. provided feedback. Both authors reviewed the manuscript and agreed to its published version.

Conflicts of interest

The authors declare no conflict of interest.

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