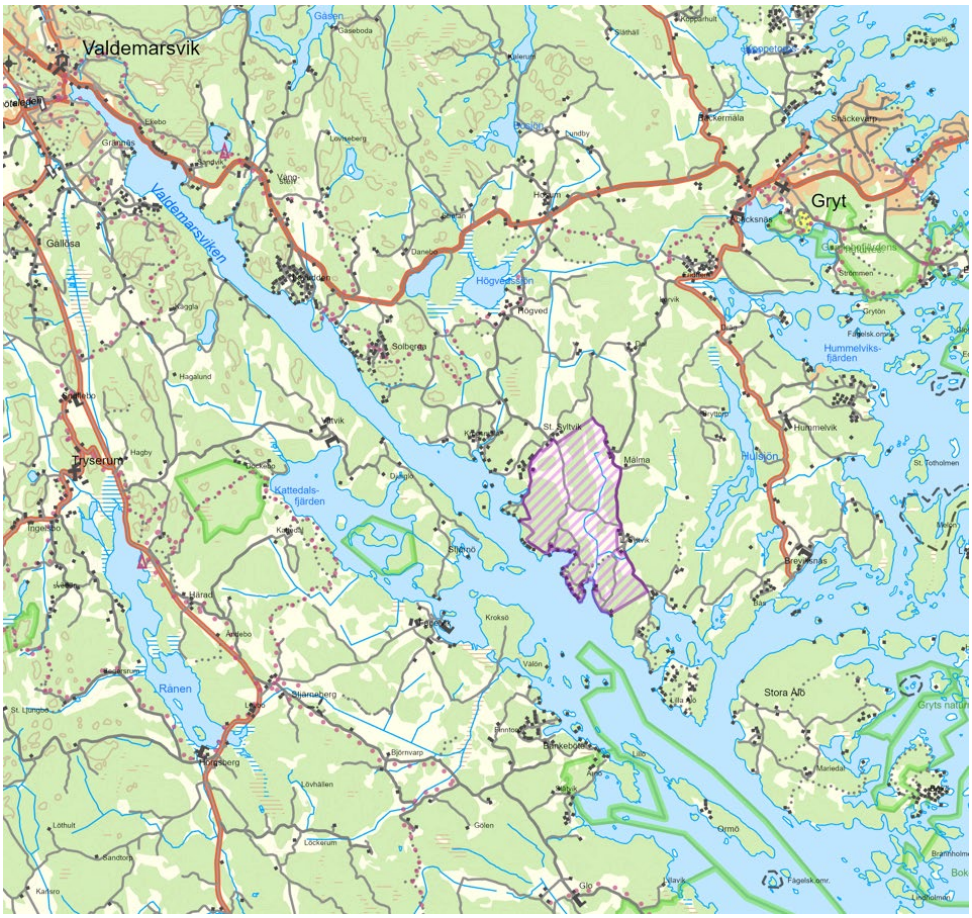
Consultation Draft - Site Plan for Nuclear Facility

Målma, Valdemarsvik Municipality



Länsstyrelsen
Östergötland

Important Information

The original document on which this text is based was written in Swedish. The translation has been carried out using AI tools.

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Summary

On behalf of the Government, the County Administrative Board of Östergötland (*Länsstyrelsen Östergötland*) is preparing a proposal for a site plan (anläggningsplan) for the establishment of a nuclear facility (kärnteknisk anläggning) on the property Målma 4:9 in Valdemarsvik Municipality. The site plan is based on an application from Refirm Målma AB and is intended to provide space for the establishment of four to six small modular reactors, which, according to the application, require an area of 50–70 hectares. Such a facility is estimated to be able to generate a total of 1,200–1,600 MW of electrical energy and thereby make a significant contribution to meeting the future national and regional energy needs.

During the consultation, the County Administrative Board presents two alternative land areas, each covering approximately 70 hectares, which shall constitute the proposed site plan. In addition to the site itself, enabling infrastructure such as roads, power lines, water and sewerage systems, and potential maritime arrangements will be required. This infrastructure is not included in the site plan (anläggningsplan) but is described in overview to highlight the area's suitability for the requested activity. In connection with the site plan, a strategic environmental assessment (strategisk miljöbedömning) is also being conducted, including an associated environmental impact assessment (miljökonsekvensbeskrivning). The plan entails an initial assessment of the proposed establishment's compatibility with the management provisions (hushållningsreglerna) in Chapters 3 and 4 of the Environmental Code (miljöbalken). Before the facility can be constructed and commissioned, several additional permits and approvals under other legislation will be required.

Based on current knowledge, establishing a nuclear facility (kärnteknisk anläggning) in the northern planning area is assessed to be feasible in compliance with the provisions of Chapters 3 and 4, Sections 1–8 of the Environmental Code. However, establishing such a facility in the southern planning area is assessed to cause significant harm (påtaglig skada) to the national interests (riksintressen) for nature conservation and outdoor recreation under Chapter 3, Section 6 of the Environmental Code, as well as the national interest (riksintresse) for mobile outdoor recreation under Chapter 4, Section 2. The planning alternative is therefore not consistent with the aforementioned regulations.

Introduction

Background

Refirm Målma AB (*the Company*) has submitted an application for government approval of a nuclear facility (kärnteknisk anläggning) within part of the property Målma 4:9 in Valdemarsvik Municipality. As a result, on 7 May 2026, the Government tasked the County Administrative Board of Östergötland with preparing a proposal for a site plan (anläggningsplan) for a nuclear facility (kärnteknisk anläggning). The site plan shall include an environmental impact assessment (miljökonsekvensbeskrivning) and a plan description (planbeskrivning), which sets out the planning prerequisites and how the plan may be implemented. The proposal for the site plan shall be prepared based on Refirm Målma AB's application.

The site plan (anläggningsplan) shall be prepared in accordance with Sections 10–14 of the Act on Government Approval of Nuclear Facilities (Lag (2026:585) om regeringens godkännande av kärntekniska anläggningar) and the administrative law principles (förvaltningsrättsliga principer) expressed in the Administrative Procedure Act (Förvaltningslag (2017:900)).

Within the scope of its mandate, the County Administrative Board shall conduct a strategic environmental assessment (strategisk miljöbedömning) and consider opinions submitted prior to the presentation of the final site plan proposal. The mandate shall be reported to the Government Offices (*Regeringskansliet*) no later than 31 December 2026.

Purpose and Delimitation

The Government may only approve a nuclear facility (kärnteknisk anläggning) if it has previously adopted a plan for nuclear facilities (plan för kärntekniska anläggningar) covering the area and facilities to which the application pertains. In its application, the Company has delimited a planning area (projekteringsområde) within the property Målma 4:9 in Valdemarsvik Municipality.

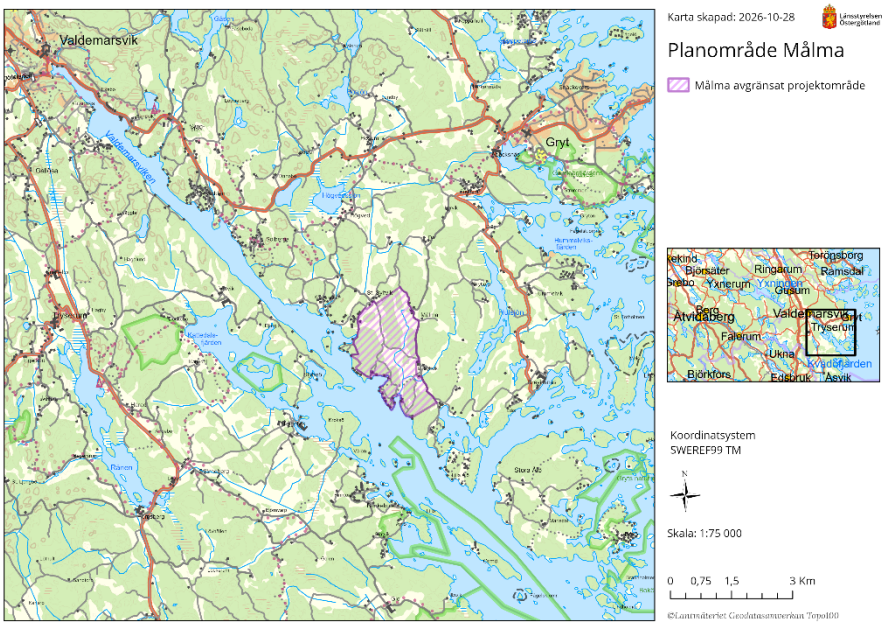


Figure 1. The planning area (marked in purple) is located approximately 11 kilometres southeast of Valdemarsvik and 5 kilometres southwest of Gryt. *Source: Refirm Målma AB's application for government approval.*

The plan assesses the compatibility with the management provisions (hushållningsreglerna) in the Environmental Code for constructing a specific type of nuclear facility (kärnteknisk anläggning) within the designated area. The preparation of this site plan (anläggningsplan) has therefore primarily been limited to issues related to Chapters 3 and 4, Sections 1–8 of the Environmental Code. However, the environmental impact assessment (miljökonsekvensbeskrivning) provides a broader analysis of the likely environmental impacts linked to additional environmental aspects.

A site plan (anläggningsplan) shall specify the types and number of nuclear facilities (kärntekniska anläggningar) that may be constructed, where these may be located, and the area that requires land use (markanspråk) for the nuclear facilities to be constructed and operated. Based on the Company's application, the planning area should enable the establishment of four to six light-water-moderated and light-water-cooled nuclear reactors, which may be of the boiling water reactor (BWR) or pressurised water reactor (PWR) type. Based on the information provided in the Company's application, the planning area should cover an area of at least 50–70 hectares.

Associated activities necessary for the facility, such as access roads and connections for electricity and cooling water supply, are not covered by the site plan (anläggningsplan). These are therefore addressed only at an overarching level to highlight at an early stage whether there are other

considerations for or against the chosen location.

Planning Process

The planning process for a site plan (anläggningsplan) for a nuclear activity (kärnteknisk verksamhet) is regulated in the Act on Government Approval of Nuclear Facilities (Lag (2026:585) om regeringens godkännande av kärntekniska anläggningar). As part of the mandate to prepare a site plan, the County Administrative Board shall also conduct a strategic environmental assessment (strategisk miljöbedömning) under Chapter 6 of the Environmental Code. The strategic environmental assessment includes conducting a scoping consultation (avgränsningssamråd) and preparing an environmental impact assessment (miljökonsekvensbeskrivning). Once the environmental impact assessment and a proposal for the site plan have been prepared, a plan consultation (plansamråd) is conducted, during which there is an opportunity to submit comments on the environmental impact assessment and the plan proposal. After the plan consultation, the County Administrative Board revises the plan proposal, taking into consideration the comments received during the consultation. The mandate is thereafter reported to the Government. Before the Government makes a decision, the municipality's position on whether to endorse the proposal is obtained. The figure below provides an overview of the steps in the process.

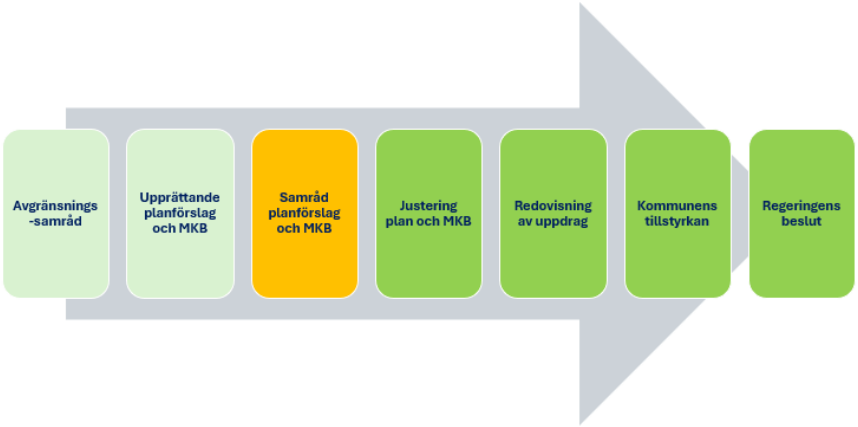


Figure 2. Overview of the process for preparing a site plan (anläggningsplan) for a nuclear facility (kärnteknisk anläggning), and the current stage of the process (marked in orange).

What is a Site Plan (Anläggningsplan)?

Under Section 9 of the Act on Government Approval of Nuclear Facilities (Lag (2026:585) om regeringens godkännande av kärntekniska

anläggningar), the Government may only approve a nuclear facility (kärnteknisk anläggning) if there is an applicable site plan (anläggningsplan) covering the facility referred to in the application.

The purpose of a site plan (anläggningsplan) is to provide guidance for decisions on the use of land and water areas. When adopting such a plan, Chapters 3 and 4, Sections 1–8 of the Environmental Code (miljöbalken) shall be applied.

A site plan (anläggningsplan) shall, at a minimum, cover what is set out in an application for government approval of a nuclear facility (kärnteknisk anläggning) in terms of the type of nuclear facilities (kärntekniska anläggningar) and the area on which the facilities are to be constructed. The plan shall specify:

- the types and number of nuclear facilities (kärntekniska anläggningar) that may be constructed,
- where these may be located, and
- the area requiring land and water use (mark- och vattenanspråk) to enable the construction and operation of the nuclear facilities (kärntekniska anläggningar).

A plan may only be adopted if an application for government approval has been submitted and the municipality(ies) within the areas covered by the plan have endorsed (*tillstyrkt*) the application and the plan. A decision to adopt a plan for nuclear facilities (plan för kärntekniska anläggningar) shall be preceded by a strategic environmental assessment (strategisk miljöbedömning) under Chapter 6 of the Environmental Code, if required by the Environmental Code.

In the Government Bill (proposition) underlying the Act on Government Approval of Nuclear Facilities (Prop. 2025/26:171, En mer ändamålsenlig prövning av kärntekniska anläggningar), it is emphasised that nuclear facilities (kärntekniska anläggningar) often have significant environmental impacts and implications for the management of land and water areas (hushållning med mark- och vattenområden). Such facilities frequently involve risks of conflicts with other land use interests. One of the purposes of the Act is to enable early clarification of whether the Government and the affected municipality(ies) deem a land or water area suitable for nuclear facilities (kärntekniska anläggningar). If such use is deemed unsuitable, it is important that the applicant is notified before the project design (*projektering*) progresses too far.

For the Government's position to serve the purpose of providing the applicant with an early indication of suitable land and water use, it is essential that the assessment does not take an excessive amount of time. The assessment should therefore have an overarching character

(övergripande karaktär), without examining detailed issues.

A site plan (anläggningsplan) is not tied to a specific operator. It may be used by any party applying for approval to construct a nuclear facility (kärnteknisk anläggning) of the type and at the location covered by the plan, without requiring the Government to make a new assessment under Chapters 3 and 4 of the Environmental Code.

To enable the Government to make the necessary balancing of interests (avvägningar), the plan should provide a basis that highlights the interests to be considered and the consequences of using the area in a particular way. The Government's adoption of the plan should therefore be preceded by a strategic environmental assessment (strategisk miljöbedömning), unless an exemption is possible under the provisions of Chapter 6 of the Environmental Code.

The plan decision (planbeslut) should account for how consideration has been given to:

- the public interests (allmänna intressen) under Chapters 3 and 4 of the Environmental Code that may be affected by the construction and operation of the nuclear facilities (kärntekniska anläggningar) covered by the plan, and
- the public interests (allmänna intressen) under Chapters 3 and 4 of the Environmental Code that may be affected by other types of activities or measures necessary for the construction and operation of a nuclear facility (kärnteknisk anläggning).

The Government's assessment may also address activities and measures undertaken outside the area covered by the plan, provided they are connected to the nuclear facility (kärnteknisk anläggning). However, associated activities (följdverksamheter) necessary for the facility, such as cooling water supply, roads, and connecting infrastructure, shall be addressed only at an overarching level (övergripande nivå) in the site plan (anläggningsplan) to identify whether there are conditions that could render the location unsuitable.

The plan decision (planbeslut) should include balancing of interests (avvägningar) between competing public interests (allmänna intressen) concerning the management of land and water areas (hushållning med mark- och vattenområden). In some cases, it may also be necessary to acknowledge public interests (allmänna intressen) that will be difficult to accommodate upon implementation of the plan, such as public access to certain parts of the affected area. The balancing of interests (avvägningar) shall be evident from the plan decision (planbeslut), as shall the Government's conclusion that it is appropriate for the land or water area to be used for one or more nuclear facilities (kärntekniska anläggningar).

Within the scope of the County Administrative Board's (Länsstyrelsens) mandate to prepare a site plan (anläggningsplan) proposal, the above need for underlying material (underlag) for the Government's assessment shall be met.

Plan Proposal

Location

The planning area (*projekteringsområde*) is located approximately 11 km southeast of the Valdemarsvik urban area, along the coastal area of Valdemarsviken, and covers part of the property Målma 4:9 in Valdemarsvik Municipality. According to the application, the proposed location was selected through a systematic process in accordance with the International Atomic Energy Agency's (IAEA) guidance documents, particularly Safety Standards Series SSG-35 and SSR-1, as well as relevant requirements in the Swedish Radiation Safety Authority's (Strålsäkerhetsmyndigheten, SSM) regulations, including:

- SSMFS 2021:4 (Regulations and General Advice on the Construction of Nuclear Power Reactors)
- SSMFS 2008:12 (Regulations and General Advice on the Physical Protection of Nuclear Facilities),
  and with regard to the management provisions (hushållningsbestämmelser) in Chapters 3 and 4 of the Environmental Code.

The area is primarily characterised by farmland and elevated areas with coniferous forest and is currently not subject to industrial operations. The topography consists of slightly rolling agricultural land, surrounded by rocky formations with heights of approximately 25–40 metres. The site is located adjacent to the sea and Valdemarsviken, and includes local natural and cultural values, as well as an area with recreational housing (*fritidshusbebyggelse*).

The site plan (anläggningsplan) aims to designate an area within the planning area (*projekteringsområde*) where it is possible to construct a nuclear facility (kärnteknisk anläggning). The selection of the planning area considered, *inter alia*, the following site selection factors (lokaliseringsförutsättningar):

- available land area,
- possibilities for cooling water supply,
- impact of sea level rise, and
- connection to the electricity grid and other infrastructure.

At the same time, public interests (allmänna intressen) and environmental values within and around the area must be taken into account when assessing its suitability.

Land Use (Markanspråk) and Design

Land Use (Markanspråk)

This site plan (anläggningsplan) proposal presents two alternative locations for the planning area – one northern and one southern – of which only one can eventually be adopted as the final planning area (*planområde*). Each alternative corresponds to an area of approximately 70 hectares.

The proposed planning areas (*planområden*) each comprise the area assessed to be necessary for the construction, operation, and future decommissioning of the nuclear facility (kärnteknisk anläggning). The land use (markanspråk) includes space for:

- reactor facilities with turbine and service buildings,
- internal roads,
- safety functions,
- technical supply systems,
- cooling water systems,
- electricity connections, and
- other facility components required for the operation and safety of the activity.

The final extent of the land use (markanspråk) will depend on the choice of reactor type, facility design, cooling principle, and technical solutions. The site plan (anläggningsplan) therefore delineates an area that is assessed to provide sufficient flexibility for continued project design (*projektering*), while also enabling a comprehensive assessment of the plan's environmental effects.

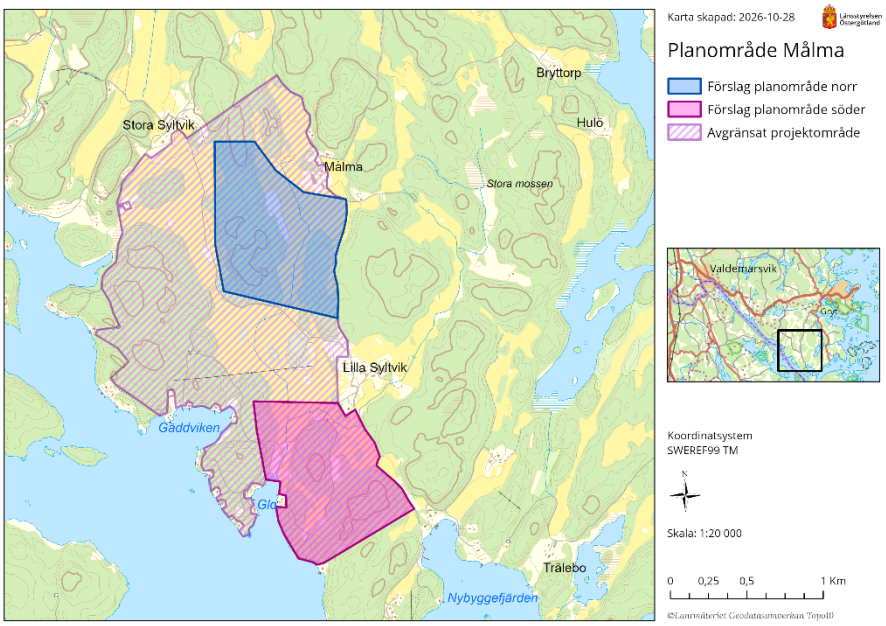


Figure 3. A northern (blue marking) and a southern (pink marking) planning area are being investigated within the project area (*projekteringsområde*), illustrated with purple hatching. *Source: Refirm Målma AB's application for government approval and the County Administrative Board of Östergötland.*

The most significant difference between the planning alternatives, in terms of the practical conditions for constructing and operating the nuclear facility (kärnteknisk anläggning), is that the southern alternative allows for the construction of an on-site port adjacent to the establishment. This would enable some transport needs to be met by sea, facilitating the establishment – particularly during the construction phase – and providing close access to Valdemarsviken for the intake and discharge of cooling water. The northern alternative does not provide access to a port and would need to address transport needs via the road network. However, this alternative would spare the protected shoreline environment from major interventions and result in less impact on both the landscape and existing development in the surrounding area.

The areas required for reactor facilities, technical buildings, and associated infrastructure must also allow for the physical protection (*fysiskt skydd*) of the facility. A nuclear facility (kärnteknisk anläggning) of this kind is expected to be subject to a protected object classification (*skyddsobjekt*) under the Protected Objects Act (Skyddslagen, 2010:305) and to requirements for security protection and physical protection (*fysiskt skydd*). The final demarcation of the guarded area (*bevakat område*) cannot be determined at this stage, as the final design of the facility and the choice of reactor type have not yet been made. However, it is assumed that the guarded area (*bevakat område*) will cover most of the planning area (*planområde*).

Both alternatives are characterised by topographical ridges of bedrock and intervening low-lying areas where the soil consists of clay. The elevation differences within each area amount to approximately 30 metres. This means that substantial earthworks will be required to prepare the area for the establishment. The elevated sections will need to be blasted down, and the lower sections filled in or covered to create a level surface. The site's elevation must be set to ensure that the facility's vital components are not damaged by flooding and should therefore be adapted to projected sea level rise. According to the County Administrative Board's assessment, this means that the establishment site should have a minimum elevation of at least 3.2 metres above the current mean sea level. This will require raising the lower sections across the entire southern, and parts of the northern, planning alternative compared to present levels. During subsequent detailed development planning (*detaljplaneläggning*) and project design (*projektering*), further investigations of the area's geotechnical conditions, groundwater, archaeology, and natural values will be necessary, which have not been possible within the framework of preparing the site plan (anläggningsplan).

During the construction phase, a larger area than the planning area (*planområde*) will likely need to be used as a works area (*arbetsyta*). This will be used for the storage of construction materials, transport, and various service functions required during the construction phase. For this purpose, two potential areas have been identified as possible. These areas are not included in the site plan (anläggningsplan) and shall, after the facility has been constructed, be restored to their original use or another use. The selection of a works area (*arbetsyta*) may depend on the final alignment of the access road to the site. If the nuclear facility (kärnteknisk anläggning) is constructed in several stages, the need for external works areas will decrease, as parts of the intended site can be used as a works area (*arbetsyta*).

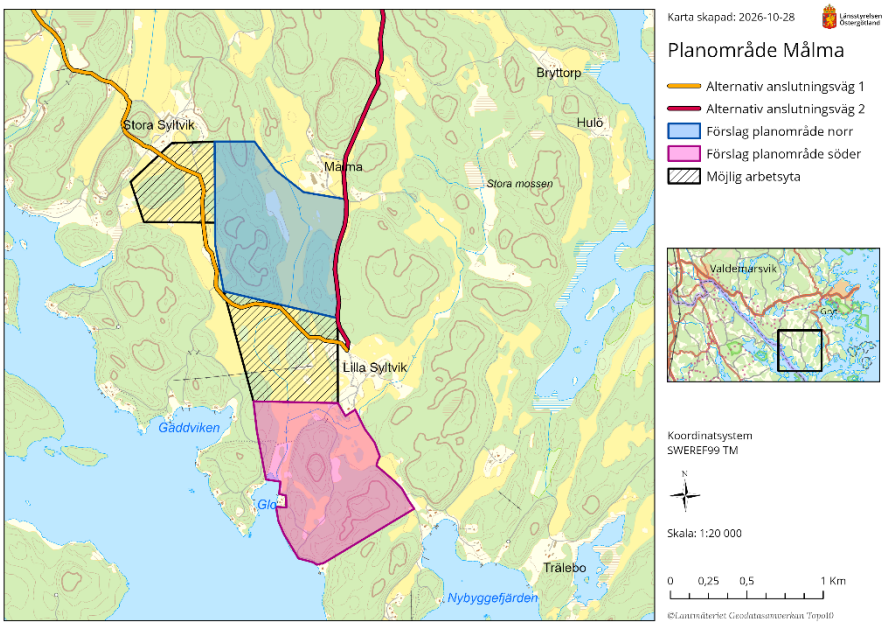


Figure 4. The image shows two potential works areas (*arbetsytor*) (hatched in black) relative to the two planning alternatives (blue and pink markings) and proposed alternative access roads (yellow and red lines). *Source: Refirm Målma AB's application for government approval and the County Administrative Board of Östergötland.*

Design

The facility is expected to accommodate 4–6 reactors in the form of so-called small modular reactors (SMRs) (either boiling water reactors (BWR) or pressurised water reactors (PWR)). No final decision on the technology has yet been made in the application, but the site plan (anläggningsplan) assumes that the reactor buildings will be approximately 100 m × 200 m in size and have an above-ground height of approximately 20–30 metres. The reactors themselves may also need to be located approximately 30 metres below the surrounding ground level. In addition, turbines and other process equipment, switchgear, and service and safety functions must be accommodated within the facility. It may also be necessary to include a treatment plant for process water and a reserve water supply system within the area. Space requirements will also depend on the cooling technology chosen for the facility. The area should also provide space for the installation of potential cooling towers.

Emergency Planning Zones (Beredskapszoner)

All or most of the planning area (*planområde*) of the facility, including the area for nuclear facilities (kärntekniska anläggningar), will be fenced off so that the public does not have access to the area. A facility of this type will constitute a protected object (*skyddsobjekt*) and will be regulated, in

addition to the Nuclear Activities Act (Kärntekniklagen), also by the Protected Objects Act (Skyddslagen, 2010:305) and the Security Protection Act (Säkerhetsskyddslagen, 2018:585). These provide the legal basis for a general prohibition on access, the right to carry out inspections (*visitationsrätt*), and guarding by protective security officers. The design of the physical protection (*fysiskt skydd*) and the demarcation of the facility area are further regulated by the Swedish Radiation Safety Authority's (Strålsäkerhetsmyndigheten, SSM) regulations, particularly SSMFS 2008:12, and are based on the design-basis adversarial threat scenarios established for Swedish nuclear facilities (kärntekniska anläggningar). The purpose of the physical protection (*fysiskt skydd*) is to protect the facility from unauthorised intrusion, sabotage, or other interference. The facility area is divided into different zones with escalating requirements for guarding and control.

Emergency Planning Zones (Beredskapszoner) and Urgent Protective Measures

The facility will include an inner emergency planning zone (*inre beredskapszon*) and an outer emergency planning zone (*yttre beredskapszon*), each with different levels of emergency preparedness measures (*beredskapsåtgärder*). The emergency planning zones (*beredskapszoner*) are administrative tools to enable society to prepare for extremely unlikely but serious accidents. The inner zone (*inre zonen*) aims to facilitate rapid evacuation, while the outer zone (*yttre zonen*) aims to reduce the risk of long-term health effects through planned protective measures.

The final inner and outer emergency planning zones (*inre och yttre beredskapszoner*) will, in accordance with current regulations, be determined by the County Administrative Board in a process under:

- Chapter 4, Section 6 of the Act on Protection Against Accidents (Lag (2003:778) om skydd mot olyckor, LSO)
- Chapter 4, Sections 15 and 21 of the Ordinance on Protection Against Accidents (Förordning (2003:879) om skydd mot olyckor, FSO).

The description of the emergency planning zones (*beredskapszoner*) in the site plan (anläggningsplan) therefore aims to enable the Government to assess the suitability of the facility's location from an emergency preparedness perspective (*cf. Government Bill 2025/26:171, p. 36*). Before the County Administrative Board decides on the emergency planning zones (*beredskapszoner*), more detailed documentation will need to be prepared. The description provided in this plan is more overarching (*övergripande*) in nature, and the extent of the emergency planning zones (*beredskapszoner*) has been assessed conservatively. The description is based on currently applicable regulations regarding maximum emergency planning zones (*beredskapszoner*) and planning

distances (*planeringsavstånd*). For the planned facility, a system with a maximum inner and outer emergency planning zone (*beredskapszon*) and an extended planning distance (*utökat planeringsavstånd*) is currently applied.

Inner Emergency Planning Zone (Inre beredskapszon) (approx. 5 km): Covers the geographic area in which preparations for urgent protective measures (*brådskande skyddsåtgärder*) have been made in advance. The zone (*zon*) extends on both sides of Valdemarsviken and includes some populated islands in the archipelago. The area contains scattered development, primarily concentrated along the coast. A small part of the urban area of Gryt is also included in the zone (*zon*). The population within the zone (*zon*) amounts to approximately 375 persons. If the entire urban area of Gryt-Snäckevarp is included, the population amounts to approximately 650 persons (*Statistics Sweden, SCB, 2024*). In addition, there are a large number of properties used as recreational housing (*fritidshusbebyggelse*). At Hummelvik/Gryts Varv, there is a visitor facility with marinas, hotels, and other temporary accommodation.

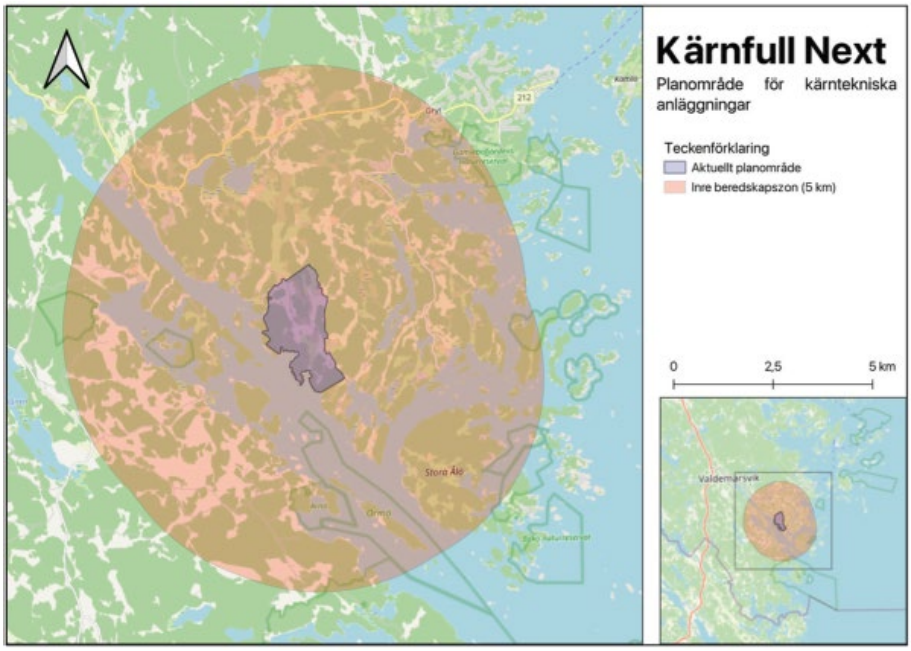


Figure 5. The extent of the inner emergency planning zone (*inre beredskapszon*) (5 km) is preliminary and will be investigated and specified at a later stage. *Source: Refirm Målma AB's application for government approval.*

The emergency preparedness planning (*beredskapsplanering*) includes systems for immediate warning (outdoor and indoor), pre-distribution of iodine tablets to all households and businesses, and prepared evacuation routes. The primary protective measure in the event of a design-basis accident is indoor stay with ventilation closed. However, the zone (*zon*)

is dimensioned to enable rapid evacuation regardless of wind direction. A comparative analysis with the inner emergency planning zones (*inre beredskapszoner*) of existing nuclear power plants shows that the number of residents at the proposed site is significantly lower, which facilitates the planning of protective measures. At the same time, the possible evacuation routes available are the public roads 212 and 816 and travel by sea. If a nuclear power facility is established in accordance with the site plan (anläggningsplan), the public roads – particularly Road 212 – will need to be upgraded and rebuilt to maintain functionality in light of future sea level rise.

Outer Emergency Planning Zone (Y*ttre beredskapszon*) (approx. 25 km): Covers an area where planning exists for rapid measures based on dispersion forecasts and detection. Within the zone (*zon*), almost 10,000 inhabitants live. Besides Valdemarsvik, the zone (*zon*) also includes parts of Söderköping, Åtvidaberg, and Västervik municipalities. The urban area of Valdemarsvik, located approximately 11 kilometres west of the facility, is the largest population concentration, with around 4,500 inhabitants. Gryt's archipelago and parts of St. Anna's archipelago (including the harbours at Fyrudden and Tyrislöt), as well as the E22 road, are also included in the zone (*zon*).

Within the part of the zone (*zon*) that lies in Valdemarsvik, certain critical societal functions (*samhällsviktiga funktioner*) have been identified in the application. These include:

- five preschools,
- four primary schools,
- one health centre, and
- one child health centre.

In addition, there are a few residential care homes for the elderly and facilities for persons with disabilities (*LSS-boenden*) in the municipality. Emergency preparedness focuses on needs-based distribution of iodine tablets from depots and sectoral evacuation.

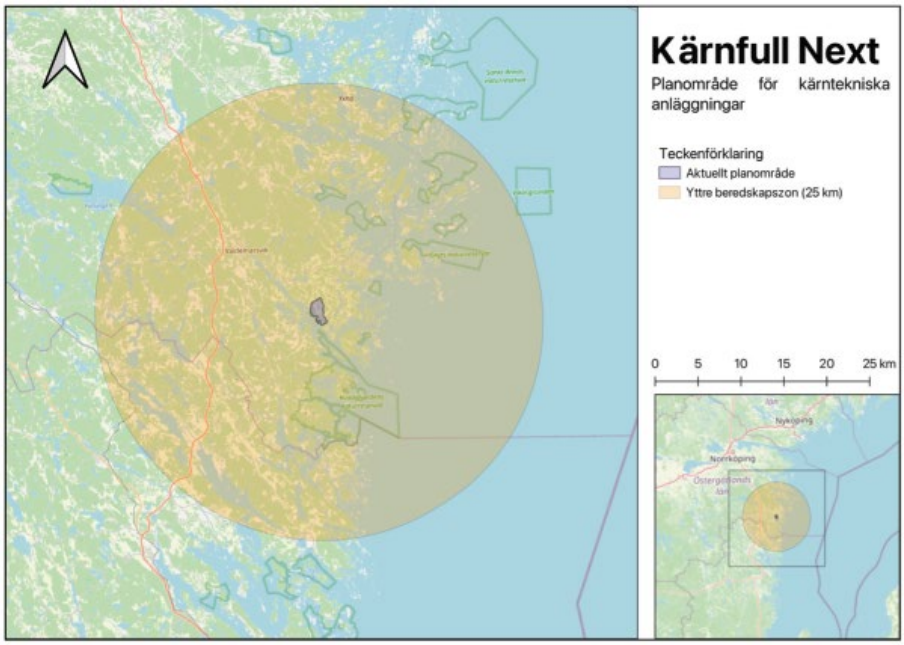


Figure 6. The extent of the outer emergency planning zone (*yttre beredskapszon*) (25 km) is preliminary and will be investigated and specified at a later stage. *Source: Refirm Målma AB's application for government approval.*

A comparison with Oskarshamn Municipality shows that the number of critical societal functions (*samhällskritiska anläggningar*) within the 25-kilometre zone (*zon*) in Valdemarsvik is significantly lower. As a reference, the corresponding zone (*zon*) in Oskarshamn includes around twenty preschools, ten primary schools, a hospital, and a much larger number of health centres and care homes. The lower concentration of critical facilities in Valdemarsvik reduces the logistical burden on emergency preparedness organisations in the event of an incident. However, the transport infrastructure in Gryt's coastal and archipelago areas – compared to Oskarshamn – has limited capacity, which is assessed to complicate rescue operations and effective evacuation, a factor that must be weighed in the assessment. In further planning, consideration will need to be given to how and whether this capacity can be strengthened.

Planning Distance (*Planeringsavstånd*) (approx. 100 km):
Covers a larger area around the facility to enable long-term and sustained emergency preparedness planning. Within this area, which includes several urban areas in Östergötland and Kalmar counties with a total population of approximately 500,000 persons, planning focuses on established systems for environmental monitoring and effective communication. This also includes procedures for the quality assurance of local agricultural and food products, with the aim of proactively

protecting the production chain and ensuring a long-term sustainable living environment.

The demographic conditions and infrastructure around the chosen site are assessed to permit the effective implementation of urgent protective measures (*brådskande skyddsåtgärder*). For government approval, a robust emergency preparedness organisation (*beredskapsorganisation*) is required, which necessitates established collaboration between the operator (*verksamhetsutövaren*), the County Administrative Board, other authorities, and the municipal rescue services.

Radioactive Waste Management

The expected management of radioactive waste from the activity is described in Refirm Målma AB's application for government approval of a nuclear facility (kärnteknisk anläggning). The application states, among other things, the following.

Radioactive waste is classified internationally according to guidelines from the International Atomic Energy Agency (IAEA), based on activity levels, the presence of long-lived radionuclides, and heat generation. The classification primarily aims to link different types of waste to appropriate final disposal solutions (slutförvarslösningar) from a long-term safety perspective. In IAEA (2017), radioactive waste is divided into six main categories, as shown in the table below.

IAEA, 2017	Svensk benämning	Exempel på typ av avfall
EW	Undantaget avfall	Material som ej omfattas av strålskyddslagstiftningen
VSLW	Mycket kortlivat avfall	Medicinska isotoper, laboratorie- och forskningsmaterial
VLLW	Mycket lågaktivt avfall	Lätt kontaminerad jord, betong, isolering, skyddskläder
LLW	Lågaktivt avfall	Skyddskläder, verktyg, lågt kontaminerade komponenter
ILW	Medelaktivt avfall	Reaktorkomponenter, härdinterndelar, slam
HLW	Högaktivt avfall	Använt kärnbränsle och/ eller upparbetat avfall

Figure 7. Classification of different types of waste according to the International Atomic Energy Agency (IAEA) 2017. *Source: Refirm Målma AB's application for government approval.*

The lower categories (EW, VSLW, and VLLW) include waste with low activity or short half-life, which in many cases may be cleared (frikklassas) (determined to fall below activity limits and thereby managed through conventional waste handling) or disposed of in near-surface facilities with limited protective barriers until it can be managed conventionally. These types of waste are therefore not considered strictly determinative (dimensionerande) for the project's long-term radiological waste management and are consequently not addressed further in the application underlying the site plan (anläggningsplan).

Below, the overall management and principles for high-level waste

(HLW), primarily spent nuclear fuel, low- and intermediate-level waste (LILW) from operations, and a general estimate of the amounts of radioactive waste generated during the future decommissioning and dismantling of the facility are instead presented.

Waste Management – General Methodology

The project is based on internationally established principles in accordance with IAEA Safety Standards. Waste management is founded on a systematic and traceable management chain (hanteringskedja), where each step is technically and safety-wise adapted to the type of waste and future disposal solution. In summary, this means that:

- Radioactive waste is collected, characterised, and sorted.
- Volume reduction is implemented where technically and safety-wise appropriate.
- Waste is prepared before packaging, storage, or transport.
- Spent nuclear fuel is initially stored in a pool for cooling and later transferred to a suitable interim storage system (mellanlagringssystem).
- Storage and transport occur in approved systems with required containment, radiation shielding, and monitoring.

For the project, this means that the waste management system is dimensioned and conceptualised from an early stage in accordance with internationally recognised principles of stepwise, traceable, and compatible management. No part of the management chain (hanteringskedja) shall restrict or jeopardise subsequent steps. In future permit applications and safety reports, the project will provide more detailed accounts of classification and estimated waste flows, technical solutions for treatment and storage, systems for characterisation and documentation, and principles for transport and handover to an approved final disposal solution (slutförvarslösning).

Short-term Storage of Spent Nuclear Fuel

Nuclear fuel is typically replaced once a year during a scheduled outage. In boiling water reactors, approximately one-fifth of the fuel is replaced each year, while in pressurised water reactors, approximately one-third is replaced.

When the reactor is shut down and the chain reaction ceases, the spent fuel continues to emit heat (residual heat (resteffekt)). Immediately after shutdown, the residual heat corresponds to approximately 6–7 percent of the reactor's previous thermal output. After about one week, the residual heat has decreased by approximately 95 percent. The spent fuel assemblies can then be moved from the reactor to a pool in the reactor building, where cooling and radiation shielding continue underwater.

The fuel is typically stored in the pool for at least one year, often longer, during which both heat generation and radioactivity decrease further.

For the planned facility, the total amount of spent fuel generated during operation is estimated to be approximately 30–50 tonnes per year, depending on the number of reactors and their power output. This estimate is overarching (övergripande) and will be specified in subsequent permitting stages.

Interim Storage and Final Disposal of Spent Nuclear Fuel

In the current Swedish system, all spent nuclear fuel is, after initial pool storage at each reactor facility, transported to the Central Interim Storage Facility for Spent Nuclear Fuel (Clab (Centralt mellanlager för använt kärnbränsle)) in Oskarshamn. The facility holds government approval for the interim storage (mellanlagring) of spent nuclear fuel for a limited period.

Transport is conducted in approved transport casks (transportbehållare) with high mechanical strength and extensive radiation shielding. Transport is typically carried out by sea using the specially built transport vessel M/S Sigrid, which is designed and approved for the transport of nuclear materials in accordance with national and international regulations. If transport from the facility cannot be carried out by sea, solutions must be sought where the waste can instead be transported via the adjacent road network, i.e., Roads 212 and E22.

Implementation

For implementation to be possible, certain infrastructure must be put in place at an early stage. This primarily concerns infrastructure such as roads or a potential port for transporting materials to and from the area, electricity connection during the construction phase, water and sewerage connections for construction needs, works areas (arbets- och upplagsytor), and housing for personnel working on the establishment.

The need for housing for construction personnel during the construction phase is estimated to be between 1,500 and 3,000 beds during the most intensive construction period. The land requirement is estimated at approximately 10–20 hectares, where areas with existing or planned detailed development planning (detaljplanering) should be prioritised to ensure the long-term use of the areas. This will primarily be a matter for the municipality to address.

Property Law Conditions

A property law inventory has been carried out in the application for the area. The rights assessed to be of greatest significance for the implementation of the plan primarily relate to water and sewerage facilities and high-voltage power lines. The property is also part of

several joint facilities (gemensamhetsanläggningar) for road purposes that either cross or border the planning area (planområde).

Potential infringements on existing rights of a public-law nature (officialrättslig karaktär) are managed through land survey procedures (lantmäteriförrättning) or permit processes. Contract-based rights (avtalsbaserade rättigheter) may be addressed through renegotiation or civil law agreements, which will need to be clarified in subsequent processes.

The precise need for property formation measures (fastighetsbildningsåtgärder) will be determined at a later stage of the process in connection with detailed development planning (detaljplaneläggning).

Validity Period

The site plan (anläggningsplan) is proposed to remain valid for 15 years from the date of its adoption.

Upcoming Permitting Processes

A permit under the Act on Government Approval of Nuclear Facilities (Lag (2026:585) om regeringens godkännande av kärntekniska anläggningar) constitutes an early position by the Government that the requested activity is compatible with national energy policy objectives, public interests (allmänna intressen), and long-term sustainable development. The Government may approve a nuclear facility (kärnteknisk anläggning) if:

- The type of activity referred to in the application is justified on the grounds that its benefits outweigh the disadvantages it may entail;
- It is not unsuitable to construct and operate the facility at the intended location from an emergency preparedness perspective (beredskapsperspektiv); and
- For a facility that is neither an interim storage facility (mellanlager) nor a final disposal facility (slutförvar) and that handles nuclear materials or generates radioactive waste, there are conditions in place for the management of the nuclear materials or radioactive waste.

However, government approval is only the first step in the process for constructing and operating a nuclear facility (kärnteknisk anläggning). In addition to government approval, several further permits and approvals under various legislations are required before the activity may commence. Many of the subsequent permitting processes are extensive

and typically take several years to complete. Below is a general overview of the additional assessments that must be carried out before an activity at a nuclear facility (kärnteknisk anläggning) may begin.

The Environmental Code (Miljöbalken)

Nuclear activity (Kärnteknisk verksamhet) constitutes environmentally hazardous activity (miljöfarlig verksamhet) under Chapter 9 of the Environmental Code (Miljöbalken, 1998:808). Which environmentally hazardous activities (miljöfarliga verksamheter) require a permit under Chapter 9 of the Environmental Code is set out in the Environmental Assessment Ordinance (Miljöprövningsförordningen, 2013:251). According to Section 21(7) of the Environmental Assessment Ordinance, permit requirement A (tillståndsplikt A) applies to nuclear power reactors or other nuclear reactors. Activities subject to permit requirement A (tillståndsplikt A) are assessed by the Land and Environment Court (Mark- och miljödomstolen).

Nuclear activities (Kärnteknisk verksamhet) often involve the diversion of surface and groundwater to such an extent that a permit is also required for water operations (vattenverksamhet) under Chapter 11 of the Environmental Code. Digging or blasting in a water area also constitutes water operations (vattenverksamhet) that may require a permit. Permits for water operations (vattenverksamhet) are also assessed by the Land and Environment Court (Mark- och miljödomstolen). The assessment under Chapters 9 and 11 of the Environmental Code is conducted simultaneously as a comprehensive assessment (samlad prövning).

At nuclear facilities (kärntekniska anläggningar), hazardous substances are often handled in such types and quantities that the activity also constitutes a so-called Seveso activity (Sevesoverksamhet) under the Seveso Act (Lag (1999:381) om åtgärder för att förebygga och begränsa följderna av allvarliga kemikalieolyckor). The assessment under the Seveso Act is also conducted by the Land and Environment Court (Mark- och miljödomstolen), in conjunction with the assessment under Chapters 9 and 11 of the Environmental Code.

In the assessment under the Environmental Code, the general consideration provisions (allmänna hänsynsreglerna) under Chapter 2 of the Environmental Code are applied. This includes, among other things, a location assessment (lokaliseringsprövning) under Section 6 of Chapter 2, which states that for an activity or measure requiring the use of a land or water area, a location should be chosen that is suitable, taking into account that the purpose should be achieved with the least intrusion and inconvenience to human health and the environment.

The permit assessment under the Environmental Code also examines the

compatibility of the activity with the environmental quality standards (miljökvalitetsnormer) under Chapter 5 of the Environmental Code. An activity may not be permitted if it causes such increased pollution or disturbance that it results in impermissible deterioration of the water environment or jeopardises the possibility of achieving the status that the water should have under an environmental quality standard (miljökvalitetsnorm).

The assessment under the Environmental Code also addresses issues related to species protection.

The Nuclear Activities Act (Kärntekniklagen)

Nuclear activities (Kärnteknisk verksamhet) also require a permit under the Nuclear Activities Act (Lag (1984:3) om kärnteknisk verksamhet). The permit requirement for nuclear facilities (kärntekniska anläggningar) is regulated in Section 5 of the Nuclear Activities Act. Permit applications under the Nuclear Activities Act are assessed by the Swedish Radiation Safety Authority (Strålsäkerhetsmyndigheten, SSM).

Regarding provisions on radiation protection, the Nuclear Activities Act also refers to the Radiation Protection Act (Strålskyddslagen, 2018:396). When assessing a permit under the Nuclear Activities Act, several provisions of the Environmental Code must also be applied, including:

- The general consideration provisions (allmänna hänsynsreglerna) (Chapter 2);
- Provisions on plans and planning documentation (Chapter 3);
- Provisions on environmental quality standards (miljökvalitetsnormer) (Chapter 5); and
- Provisions on environmental assessments and environmental impact assessments (miljökonsekvensbeskrivningar) (Chapter 6).

The operator of nuclear activities (kärnteknisk verksamhet) at a nuclear facility (kärnteknisk anläggning) may also require a permit for activities involving ionising radiation under Chapter 6 of the Radiation Protection Act, which is also assessed by the Swedish Radiation Safety Authority (SSM).

For nuclear activities (kärnteknisk verksamhet) at a nuclear facility (kärnteknisk anläggning), further permits may also be required, such as various types of transport permits. Additionally, certain equipment at the facilities may be subject to notification requirements (anmälningsplikt).

The Nuclear Activities Act regulates nuclear activities (kärnteknisk verksamhet) with a particular focus on nuclear safety, the prevention of radiological emergencies, and the mitigation and management of the consequences of such events. According to the Act, a nuclear facility

(kärnteknisk anläggning) must be designed, located, constructed, commissioned, operated, and decommissioned in such a way that radiological emergencies are avoided and that the consequences can be managed if such a situation nevertheless occurs. The Act also requires measures to prevent and limit the release of radioactive substances and to prevent releases that could necessitate protective measures outside the facility.

The Planning and Building Act (Plan- och bygglagen)

Prior to the construction of a nuclear facility (kärnteknisk anläggning), a detailed development plan (detaljplan) under the Planning and Building Act (Plan- och bygglagen, 2010:900) must be prepared. In the detailed development plan (detaljplan), the municipality assesses the suitability of the land for a specific type of development or structure, based on both public and private interests. The detailed development plan (detaljplan) regulates land and water use as well as the design of the development. Risks associated with climate change, including more extreme weather and rising sea levels, are also addressed in the planning process.

A site plan (anläggningsplan) specifies the area as well as the type and scope of the activity that may be conducted within the plan and thus serves as guidance for continued planning and subsequent assessments. The municipality must therefore adhere to the site plan (anläggningsplan) in connection with subsequent assessments under the Planning and Building Act within the area.

After a detailed development plan (detaljplan) has been adopted, a building permit (bygglov) from the municipality's building committee is also required to construct the development and other structures within a nuclear facility (kärnteknisk anläggning).

Environmental Impact Assessment (Miljökonsekvensbeskrivning)

In connection with the preparation of a site plan (anläggningsplan), a strategic environmental assessment (strategisk miljöbedömning) under Chapter 6 of the Environmental Code must be conducted. The purpose of a strategic environmental assessment (strategisk miljöbedömning) is to integrate environmental aspects into planning to promote sustainable development. Within the strategic environmental assessment (strategisk miljöbedömning), an environmental impact assessment (miljökonsekvensbeskrivning) must be prepared. Prior to preparing the environmental impact assessment (miljökonsekvensbeskrivning), the authority responsible for preparing the plan must consult on the scope and level of detail of the environmental impact assessment

(miljökonsekvensbeskrivning) in a so-called scoping consultation (avgränsningssamråd). Once the environmental impact assessment (miljökonsekvensbeskrivning) and the plan proposal have been prepared, a plan consultation (plansamråd) is conducted where there is an opportunity to submit comments on the environmental impact assessment (miljökonsekvensbeskrivning) and the proposal for the site plan (anläggningsplan). When deciding to adopt a plan, consideration shall be given to the environmental impact assessment (miljökonsekvensbeskrivning) and the comments received during the plan consultation (plansamråd).

Strategic Environmental Assessment for the Målma Site Plan

The County Administrative Board has conducted a scoping consultation (avgränsningssamråd) with the municipalities, county administrative boards, and other authorities that the County Administrative Board assesses, due to their specific environmental responsibilities, are likely to be affected by the site plan (anläggningsplan). The scoping consultation (avgränsningssamråd) was initiated on 18 August 2026 by sending out consultation materials, with an opportunity to submit comments. The last day to submit comments during the scoping consultation (avgränsningssamråd) was 21 September 2026.

After the scoping consultation (avgränsningssamråd) was concluded, the County Administrative Board, through an interlocutory decision on 1 October 2026, decided on the scope and level of detail that the environmental impact assessment (miljökonsekvensbeskrivning) for the site plan (anläggningsplan) should have. Based on the input received during the scoping consultation (avgränsningssamråd) and the decision on scope, an environmental impact assessment (miljökonsekvensbeskrivning) has been prepared, and a proposal for the site plan (anläggningsplan) has been drawn up. The environmental impact assessment (miljökonsekvensbeskrivning) provides a comprehensive assessment of the plan proposal's compatibility with the public interests (allmänna intressen) set out in Chapters 3 and 4 of the Environmental Code, the impact on environmental quality standards (miljökvalitetsnormer), and the compatibility of the plan proposal with other plans, programmes, decisions, and adopted objectives at local, regional, and national levels. During the ongoing plan consultation (plansamråd), there is an opportunity to submit comments on the plan proposal and the environmental impact assessment (miljökonsekvensbeskrivning).

Balancing of Interests and Consideration of Competing Concerns

The site plan (anläggningsplan) aims to enable the establishment of a nuclear facility (kärnteknisk anläggning) that delivers large-scale production of fossil-free energy. At the same time, such an establishment will inevitably entail significant intrusion (intrång) on the environment, impacting natural, cultural, and recreational values, as well as the management of natural resources (hushållning med naturresurser). The consultation proposal includes two alternative planning areas (planområden) that affect these values to varying degrees.

Northern Planning Area

The proposed planning area entails intrusion (intrång) on land of value for both agricultural and forestry operations. Agriculture and forestry may also be affected outside the planning area, partly through the fragmentation of usable areas, and partly through impacts from follow-up developments (följdexploateringar). However, given the significant public interest (samhällsintresse) in constructing a facility for nuclear activity (kärnteknisk verksamhet), these concerns must yield. It is also assessed that there is no possibility to avoid the intrusion by utilising other land.

Overall, the plan proposal is assessed to result in moderate to significant negative consequences for the natural environment due to:

- the permanent use (ianspråktagande) of natural land,
- loss of habitats,
- increased fragmentation,
- impaired ecological connectivity, and
- risks to protected and valuable species (skyddsvärda arter).

Significant negative consequences may arise, particularly if areas of high natural value or species of conservation concern are affected. Marine environments may also be impacted by the installation of cooling water pipelines (kylvattenledningar). However, the extent of these impacts remains uncertain, as detailed inventories have not yet been conducted and technical solutions are yet to be determined. Based on current knowledge, the impacts are assessed not to constitute an obstacle to implementing the plan proposal in relation to existing natural values.

The surroundings of the planning area currently consist of relatively sparsely built environments with recreational, outdoor, and archipelago values. Establishing nuclear facilities (kärntekniska anläggningar) will transform areas currently used for recreation into environments with a

more technical and developed character. The main consequences are expected to relate to changes in recreational opportunities and intrusion (intrång) on the national interest (riksintresse) for outdoor recreation, located approximately 500 metres from the planning area. Based on current knowledge, the impact is assessed not to constitute an obstacle to implementing the plan proposal in relation to outdoor recreation.

The effects of the nuclear facility (kärnteknisk anläggning) will result in a markedly altered landscape, where a large-scale establishment will dominate instead of the current agricultural and coastal landscape. Despite mitigation measures, the facility's dominance is likely to remain conspicuous in the landscape. This will affect properties in the surrounding area and the cultural environment around Stora Syltviks by. The facility also risks being more or less visible from within the national interest (riksintresse) area of Fågelvik. By regulating the height of the buildings and adapting their architecture and design to better blend into the surrounding landscape, the facility's impact could be mitigated. Without archaeological investigations, unknown ancient remains risk being affected or destroyed. Overall, the plan proposal is assessed to result in moderate negative consequences for the cultural environment and landscape character. Based on current knowledge, the impact is assessed not to constitute an obstacle to implementing the plan proposal in relation to cultural heritage values.

The values within the national interest (riksintresse) for unbroken coastline (obruten kust) are linked to the existing natural and cultural values. These values shall not be significantly harmed (påtagligt skadas). The area shall also give particular consideration to the interests of tourism and outdoor recreation, especially mobile outdoor recreation (rörligt friluftsliv), when assessing the permissibility of developments or other interventions in the environment. Following an amendment to the law that entered into force on 15 July 2026, it is now possible to consider a nuclear facility (kärnteknisk anläggning) in the area between Simpevarp and Arkösund. The planning area impacts local and regional natural and cultural values, but not to such an extent that it results in significant harm (påtaglig skada). Based on current knowledge, the impact is assessed not to constitute an obstacle to implementing the plan proposal in relation to the national interest (riksintresse) under Chapters 3 and 4 of the Environmental Code, mobile outdoor recreation (rörligt friluftsliv), or the unbroken coastline (obruten kust). However, follow-up developments (följdexploateringar) such as cooling water facilities, increased wastewater discharges, and power lines will require further assessment.

There is no Natura 2000 area within or in direct proximity to the project area. However, some such areas exist in the surroundings, which,

depending on the direction of the establishment, could be affected by follow-up activities (följdverksamheter). The follow-up activity (följdverksamhet) expected to pose the greatest risk to Natura 2000 areas is the intake and discharge of cooling water generated by the facility. The company has stated in its application that it is possible to reduce or entirely avoid thermal impacts on the recipient by using mechanical cooling towers with recirculating cooling. By employing such technology, there should be conditions to operate the nuclear activity (kärnteknisk verksamhet) without impacting Natura 2000 areas in the vicinity through the intake or discharge of large quantities of cooling water. Thus, there should be technical conditions to conduct the activity covered by the plan without conflicting with the Natura 2000 provisions (Natura 2000-bestämmelser) in the Environmental Code. Given these conditions, it should therefore be possible to adopt the site plan (anläggningsplan) without impediment from Section 8 of Chapter 4 of the Environmental Code.

In summary, the County Administrative Board assesses, based on current knowledge, that establishing a nuclear facility (kärnteknisk anläggning) within the northern planning area does not contravene the provisions of Chapters 3 and 4, Sections 1–8 of the Environmental Code.

Southern Planning Area

The proposed planning area entails intrusion (intrång) on land of value for both agricultural and forestry operations. Agriculture and forestry may also be affected outside the planning area, partly through fragmentation of usable areas, and partly through impacts from follow-up developments (följdexploateringar). However, given the significant public interest (samhällsintresse) in constructing a facility for nuclear activity (kärnteknisk verksamhet), these concerns must yield. It is also considered that there is no possibility to avoid the intrusion by utilising other land.

Overall, the plan proposal is assessed to result in moderate to significant negative consequences for the natural environment. This assessment is based on the presence of protected and valuable natural environments within and adjacent to the area, the risk of impacts on ecological connectivity, potential effects on both terrestrial and marine natural values, and the fact that parts of the area are covered by the national interest (riksintresse) for nature conservation in the Östergötland archipelago. The presence of protected species may also trigger the prohibitions of the Species Protection Ordinance (artskyddsförordningen), which could necessitate adjustments to the plan's design, as well as protective, precautionary, or compensatory measures. However, the uncertainties are substantial, as detailed natural value inventories and species-specific investigations have not yet been

carried out. Based on current knowledge, the impact is assessed to result in significant harm (påtaglig skada) to the national interest (riksintresse) for nature conservation and thus constitute an obstacle to implementing the plan proposal.

The planning area is located in direct proximity to Valdemarsviken and entails intrusion (intrång) on an area with an extended shore protection zone and which also constitutes a national interest (riksintresse) for outdoor recreation. Establishing nuclear facilities (kärntekniska anläggningar) will transform areas currently used for recreational purposes into environments with a more technical and developed character. Based on current knowledge, the impact is assessed to result in significant harm (påtaglig skada) to the national interest (riksintresse) for outdoor recreation and thus constitute an obstacle to implementing the plan proposal.

The effects of the nuclear facility (kärnteknisk anläggning) will result in a markedly altered landscape, where a large-scale establishment will dominate instead of the current agricultural and coastal landscape. Despite mitigation measures, the facility's dominance is likely to remain conspicuous in the landscape, affecting properties in the surrounding area. The facility also risks being visible from within the national interest (riksintresse) area of Fågelvik. Several measures related to the design may be necessary. By regulating the height of the buildings and adapting their architecture and design to better blend into the surrounding landscape, the facility's impact could be mitigated. Without archaeological investigations, unknown ancient remains risk being affected or destroyed. Based on current knowledge, the impact is assessed not to result in significant harm (påtaglig skada) to the national interest (riksintresse) for cultural heritage preservation and thus not to constitute an obstacle to implementing the plan proposal.

The values within the national interest (riksintresse) for unbroken coastline (obruten kust) are linked to the existing natural and cultural values. These values shall not be significantly harmed (påtagligt skadas). Within the area, the interests of tourism and outdoor recreation, particularly mobile outdoor recreation (rörligt friluftsliv), shall be given special consideration when assessing the permissibility of developments or other interventions in the environment. Following an amendment to the law that entered into force on 15 July 2026, it is now possible to consider a nuclear facility (kärnteknisk anläggning) in the area between Simpevarp and Arkösund. The planning area entails direct intrusion (intrång) on coastal environments with high natural values, which constitute a national interest (riksintresse) for nature and outdoor recreation. The activity would have a direct impact on the boating-based outdoor recreation in Valdemarsviken. The impact is assessed to result

in significant harm (påtaglig skada) to the national interest (riksintresse) under Chapters 3 and 4 of the Environmental Code, mobile outdoor recreation (rörligt friluftsliv), and the unbroken coastline (obruten kust), and thus constitute an obstacle to implementing the plan proposal.

There is no Natura 2000 area within or in direct proximity to the project area. However, some such areas exist in the surroundings, which, depending on the direction of the establishment, could be affected by follow-up activities (följdverksamheter). The follow-up activity (följdverksamhet) expected to pose the greatest risk to Natura 2000 areas is the intake and discharge of cooling water generated by the facility. Shipping traffic associated with the construction and operation, as well as potential dredging works, may also cause such impacts if a port is established for the nuclear facility (kärnteknisk anläggning). The company has stated in its application that it is possible to reduce or entirely avoid thermal impacts on the recipient by using mechanical cooling towers with recirculating cooling. By employing such technology, there should be conditions to operate the nuclear activity (kärnteknisk verksamhet) without impacting Natura 2000 areas in the vicinity through the intake or discharge of large quantities of cooling water. Thus, there should be technical conditions to conduct the activity covered by the plan without conflicting with the Natura 2000 provisions (Natura 2000-bestämmelser) in the Environmental Code. Any potential impact on Natura 2000 areas, resulting from port establishment and shipping traffic, is possible to regulate in subsequent assessments. Given these conditions, it should therefore be possible to adopt the site plan (anläggningsplan) without impediment from Section 8 of Chapter 4 of the Environmental Code.

In summary, the County Administrative Board assesses, based on current knowledge, that establishing a nuclear facility (kärnteknisk anläggning) within the southern planning area contravenes the provisions of Chapters 3 and 4, Sections 1–8 of the Environmental Code, as the measures are likely to cause significant harm (påtaglig skada) to the national interests (riksintressen) for nature conservation and outdoor recreation under Section 6 of Chapter 3 and the national interest (riksintresse) for mobile outdoor recreation (rörligt friluftsliv) under Section 2 of Chapter 4.

Planning Conditions

Chapters 3 and 4 of the Environmental Code (Miljöbalken)

Chapter 3 of the Environmental Code

Section 4 – Agriculture and Forestry

The establishment of a nuclear facility (kärnteknisk anläggning) will require the use (tas i anspråk) of agricultural land. Due to the undulating topography and extensive bedrock outcrops of the project area, the affected agricultural and pasture areas are limited and geographically fragmented. However, the establishment could impact agricultural operations in a wider geography.

In the immediate vicinity of the planning proposals, there are two major professional agricultural enterprises. Their farm centres are located on the properties Målma 4:9 and Syltvik 11:20, respectively. Both have cattle herds with cows and grazing operations, as well as crop cultivation. A significant proportion of the surrounding arable land consists of permanent grassland.

Examples of impacts that may affect the agricultural enterprises include:

- the loss of cultivation land and locations for animal stables due to development and exclusion from **protection zones (skyddsområde)**;
- disturbances to animal husbandry, both during the construction phase and after the facility has been commissioned, resulting from noise and vibrations.

It is essential to maintain road connections between different agricultural areas to prevent remaining usable areas from becoming isolated and difficult to cultivate.

Both planning alternatives are assessed to have a significant impact on at least one of the two existing livestock operations, at least during the construction phase. To avoid losing the possibility of grazing operations, it may therefore need to be investigated whether there are conditions for relocating the animal stables.

Section 6 – Nature Conservation

Areas of public interest (allmänt intresse) due to their natural values shall, where possible, be protected from harm. A future inventory is necessary to identify specific values and consideration requirements. Some known natural values exist within both planning alternatives and in

the intervening land areas. These are addressed in more detail in the environmental impact assessment (miljökonsekvensbeskrivning).

The southern planning alternative affects the national interest (riksintresse) for nature conservation, Östergötland Archipelago (NRO 050 68). Here, there are known values, including, among other things, woodland natural values and the shallow bay Glo.

Section 6 – Outdoor Recreation

The unique environment, high natural values, and significant importance for mobile outdoor recreation (rörligt friluftsliv) make the Östergötland Archipelago designated as a national interest (riksintresse) (FE 07), extending approximately 150 metres from the shoreline of Valdemarsviken.

Of central importance to the national interest (riksintresse) is that shore protection (strandskydd) is carefully considered, both on land and in the water. The shore protection in the affected area is extended to 150 metres on land and 300 metres in the water.

In addition to direct land intrusion (intrång), the national interest (riksintresse) is affected by the facility's environmental impact, including, among other things:

- potential water discharges,
- shipping traffic,
- disturbing noise and light, and
- changes to the landscape which degrade the surrounding environments' qualities for mobile outdoor recreation (rörligt friluftsliv).

The southern planning alternative, with the possibility of a port, entails a significant intrusion (intrång) into the shore protection zone, where the values of the national interest (riksintresse) in the affected part would be entirely lost. This issue is addressed in more detail in the environmental impact assessment (miljökonsekvensbeskrivning).

Section 6 – Cultural Heritage Conservation

In the surroundings of the project area, there are some known values of cultural environments (kulturmiljöer). On the other side of Valdemarsviken, approximately two kilometres west of the project area, lies the national interest (riksintresse) Fågelvik [E75]. This consists of a manor environment in the archipelago with medieval origins, with a building stock mainly from the late 18th century.

Stora Syltviks by, along with its surrounding agricultural landscape, which is included in the regional cultural environment programme, is

located directly adjacent to the western boundary of the project area. Some other regionally designated environments are located at Högved and Breviksnäs, a few kilometres from the project area. Further out in the archipelago, there are additional designated environments in the form of the national interests (riksintressen) Gryt's Archipelago [E77-82] and Björkskär [E76].

Depending on the design and height of the facility, these cultural heritage interests may be impacted visually to varying degrees, through changes to the landscape that distort the environmental context of these areas. The extent to which such impacts may occur will be studied in more detail in the environmental impact assessment (miljökonsekvensbeskrivning).

The nearest environments, particularly Stora Syltvik, may also be affected by environmental disturbances from the facility, reducing their usability value. At Stora Syltvik, direct interventions in the valuable environment (skyddsvärda miljön) may become relevant, such as road construction and/or the use (ianspråktagande) of land for temporary works areas (arbetsytor).

The project area is surrounded by scattered settlements, primarily along the shore, but also at Målma and Lilla Syltvik. There is no documented knowledge as to whether parts of the buildings have cultural-historical protection values (kulturhistoriska skyddsvärden), but this question should be further investigated in the continued work.

Within the project area, there are a few known ancient remains. However, the area is incompletely inventoried, and additional ancient remains are likely to be found. This will be clarified at a later stage through archaeological investigations.

Chapter 4 of the Environmental Code

The establishment of the nuclear facility (kärnteknisk anläggning) affects the coastal and archipelago area of Östergötland, which, according to Section 1 of Chapter 4, is in its entirety a national interest (riksintresse) due to its natural and cultural values. According to Section 2 of Chapter 4, the interests of tourism and outdoor recreation, particularly mobile outdoor recreation (rörligt friluftsliv), shall be given particular consideration when assessing the permissibility of developments or other interventions in the environment. This means that a project may only be permitted if it can be carried out in a way that does not significantly harm (påtagligt skada) the area's natural and cultural values. Developments that entail the expansion of existing urban areas or local business are exempt from this prohibition.

The project area is also located within the coastal stretch between

Oskarshamn and Arkösund, where, according to Section 3, there is a prohibition against the establishment of large environmentally disturbing facilities (miljöstörande anläggningar) (unbroken coastline / obruten kust). However, as a result of a recent amendment to the Environmental Code, the establishment of nuclear facilities (kärntekniska anläggningar) is now exempt from this prohibition.

The national interest (riksintresse) area has a schematic boundary extending approximately one kilometre from the shoreline along the Östergötland coast. This means that the entire southern and part of the northern planning alternative are located within the national interest (riksintresse) area.

As stated above, the Östergötland archipelago area is in its entirety designated as a national interest (riksintresse) for both nature conservation and outdoor recreation under Section 6 of Chapter 3 of the Environmental Code. These national interest claims (riksintresseanspråk) follow the shoreline and extend 150–400 metres inland, covering the entire water area of the archipelago.

In the surroundings, there are also certain designated national interests (riksintressen) for cultural heritage conservation (kulturmiljövård), primarily Fågelvik, located approximately two kilometres west of the project area, as well as Björkskär and Gryt's Archipelago 6–7 kilometres away in an easterly-northeasterly direction.

Regionally designated natural and cultural values exist both within and directly adjacent to the project area. A more detailed account of the existing values for nature, culture, and outdoor recreation is provided in the section above on protected environments under Chapter 3 of the Environmental Code and in the environmental impact assessment (miljökonsekvensbeskrivning).

The nuclear facility (kärnteknisk anläggning) affects the national interest (riksintresse) in various ways. Depending on the choice of planning alternative, interventions in valuable natural and cultural environments (skyddsvärda natur- och kulturmiljöer) occur to varying degrees. Due to insufficient inventory data, these interventions cannot be fully specified at present. However, interventions are generally greater for the southern planning alternative as it demonstrably harms national interests (riksintressen) for nature conservation and outdoor recreation.

For safety reasons, protection, restriction areas (skydds- och restriktionsområden), and potentially maritime exclusion zones will be established around the nuclear power plant. This will limit public access rights in the vicinity of the project. The facility's environmental impact, in the form of disturbing light and noise, etc., also risks making it impossible or more difficult to use potential tourist attractions and sites

for mobile outdoor recreation (rörligt friluftsliv) in the surrounding environments.

Impacts on the aquatic environment through the intake or discharge of cooling or other process water may also cause damage to local natural values and locally hamper or limit tourism and mobile outdoor recreation (rörligt friluftsliv) in Valdemarsviken.

The nuclear facility (kärnteknisk anläggning) results in significant visual and landscape changes. The large-scale infrastructure of the nuclear facility, with extensive interventions in the land for both the establishment and its connecting infrastructure, can cause a significant visual intrusion (ingrepp) into the archipelago landscape. The effects of such impacts depend on the choice of planning alternative and how the facility is designed and positioned within the establishment area.

In summary, establishing a nuclear facility (kärnteknisk anläggning) at Målma constitutes a significant intrusion (ingrepp) in an environment where the Environmental Code requires that the interests of mobile outdoor recreation (rörligt friluftsliv) and tourism be given particular consideration. Although the area currently does not host any specific destinations, values for mobile outdoor recreation (rörligt friluftsliv), or tourist attractions, there is a risk that the development will nonetheless degrade the affected part of the archipelago as a national visitor destination in the long term. The County Administrative Board finds that the choice of planning alternative plays a major role in determining the expected impact of an establishment.

Natura 2000

The purpose of a site plan (anläggningsplan) is to provide guidance for decisions on the use of land and water areas. When adopting such a plan, Chapters 3 and 4, Sections 1–8 of the Environmental Code (3 kap. och 4 kap. 1–8 §§ miljöbalken) shall be applied. According to Section 8 of Chapter 4 of the Environmental Code (4 kap. 8 § miljöbalken), the use of land and water that may affect a nature area listed under Section 27(1)(1) or (2) of Chapter 7 and that involves activities or measures requiring a permit under Section 28a of Chapter 7 may only proceed if such a permit has been granted.

Thus, if the activity covered by the site plan (anläggningsplan) is expected to significantly impact a Natura 2000 area, a permit under Section 28a of Chapter 7 of the Environmental Code (7 kap. 28 a § miljöbalken) is required for the activity to be conducted. Based on the foregoing, such an assessment shall, in such cases, be carried out already in connection with the adoption of the site plan (anläggningsplan). For a permit under Section 28a of Chapter 7 of the Environmental Code (7 kap. 28 a § miljöbalken), a specific environmental assessment (specifik

miljöbedömning) shall be conducted.

There is no Natura 2000 area within or in direct proximity to the project area. However, certain such areas in the surrounding environment could potentially be affected, depending on the direction of the establishment. These are listed in the table below.

Table 1. Natura 2000 areas in proximity to the project area. Source: Refirm Målma AB's application for government approval.

Name	Designation	Directive
Åsvikelandet-Kvädö	SE0230138	Birds Directive
Dannskären	SE0230139	Birds Directive
Högved	SE0230358	Habitats Directive
Kattedal	SE0230199	Habitats Directive
Arnö	SE0230395	Habitats Directive
Åsvikelandet-Kvädö	SE0230138	Habitats Directive
Bokö	SE0230142	Habitats Directive
Stjärnö-Fågelvik	SE0230192	Habitats Directive

The Natura 2000 areas closest to the project area are Högved (approximately 1.4 kilometres north of the project area), Stjärnö-Fågelvik (approximately 1.6 kilometres southwest of the project area), and Arnö (approximately 2.2 kilometres south of the project area). These are located at such a distance that the activity covered by the site plan (anläggningsplan) itself is not expected to cause any significant impact (betydande påverkan) on the natural habitats and species that the areas aim to protect.

Instead, impact is primarily expected to occur through the follow-up activities (följdverksamheter) that a nuclear facility (kärnteknisk anläggning) depends on to function. The follow-up activity (följdverksamhet) anticipated to pose the greatest risk of impact on Natura 2000 areas is the intake and discharge of cooling water generated by the activity. Shipping traffic associated with the construction and operation, as well as potential dredging works, may also cause such impacts if a port is established for the nuclear facility (kärnteknisk anläggning).

The company has stated that it is possible to reduce, or completely avoid, thermal impacts on the recipient by using mechanical cooling towers (mekaniska kyltorn) with recirculating cooling. According to the company's application, using cooling towers requires only about 2–5% of the water volume needed for once-through cooling (genomströmningskylning). By employing such technology, there should be conditions to operate the nuclear activity (kärnteknisk verksamhet) without impacting Natura 2000 areas in the vicinity through the intake or discharge of cooling water. Therefore, there should be technical conditions to conduct the activity covered by the plan without conflicting with the Natura 2000 provisions (Natura 2000-bestämmelser) in the Environmental Code. Given these conditions, it should thus be possible to adopt the site plan (anläggningsplan) without impediment from Section 8 of Chapter 4 of the Environmental Code (4 kap. 8 § miljöbalken).

However, using cooling towers (kyltorn) for cooling the water is a costly technology, and it is likely that the developer who potentially proceeds with investigating the conditions for nuclear activity (kärnteknisk verksamhet) within the planning area will primarily seek to apply once-through cooling (genomströmningskylning). If this is the case, a Natura 2000 permit (Natura 2000-tillstånd) will likely be required for the activity. This should then be addressed within the framework of the permit assessment under the Environmental Code required to establish and operate nuclear activities (kärnteknisk verksamhet). If a port and other maritime arrangements are established, these are also matters that are not governed by the site plan (anläggningsplan) but will need to be assessed under other procedures.

Other Planning Conditions

Infrastructure

Water and Sewerage

The current municipal water and sewerage system is not extended to the project area and does not have the capacity required to supply an establishment of this size. According to the application, the drinking water requirement during operation is estimated at 52–90 m^3/day based on the Swedish Water & Wastewater Association's (*Svenskt Vattens*) guidelines but may be adjusted upward depending on the facility's hygiene requirements and is primarily determined by the staffing at the facility. The water requirement is expected to be greater during the construction phase than during the operational phase, as staffing will be lower during operation.

The nearest possible connection point to the municipal water and sewerage network is estimated to be approximately 10–12 kilometres from the project area. Connecting to this point will require investments, including a new main line, pumping stations, and potentially a reconstruction of the existing treatment plant. An alternative is to investigate the possibility of a separate water intake for the facility, with an associated treatment plant, which could act as a buffer and increase operational reliability during disruptions by supplying process water, sanitary water, and fire-fighting water.

Before a final decision is made on how to secure the water and sewerage supply, an in-depth dialogue with Valdemarsvik Municipality needs to be conducted to clarify which parts of the existing infrastructure can be utilised. Based on this, it will be determined whether it is possible to expand the water and sewerage network or if an independent facility needs to be established.

Roads

The establishment of a nuclear facility (kärnteknisk anläggning) imposes greater demands on the road network, both during the construction and operational phases. During the construction phase, a very extensive transport operation is expected. The scale of the required transport depends on various factors, including whether a port can be established within the planning area. A decisive factor for the number of road transports is, among others, whether such a port can be constructed.

During the operational phase, the application estimates that the number of transports will amount to 250–300 passenger cars, a few buses, and a limited number of freight transports per day.

According to the application, transports are primarily intended to occur via the private road network connecting to Road 212. The application also highlights two road alternatives from the project area that will connect to Road 212.

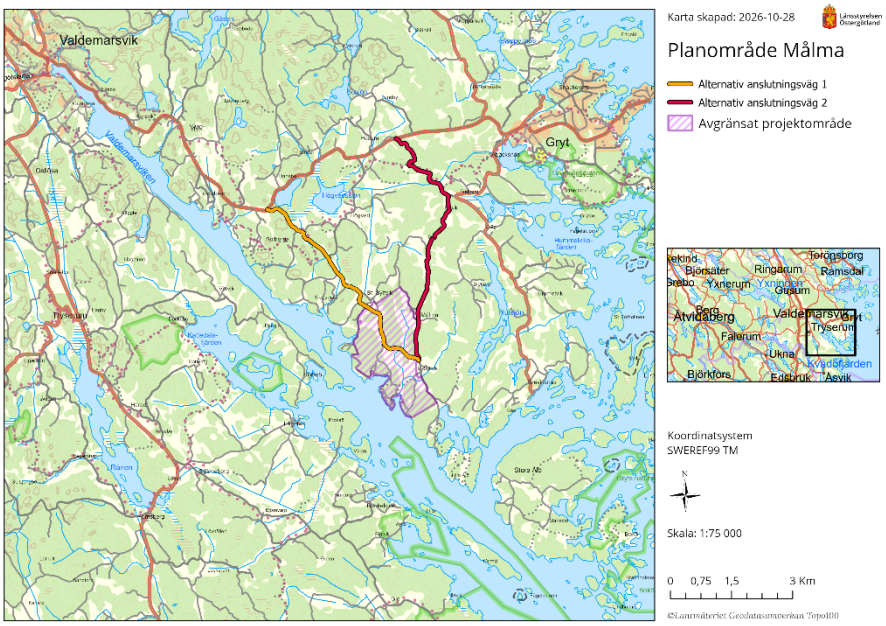


Figure 8. The alternative connecting roads (yellow and red lines) proposed in the application to and from the project area (marked with purple hatching). *Source: Refirm Målma AB's application for government approval and the County Administrative Board of Östergötland.*

The first alternative includes an existing road section of approximately seven kilometres, and the second alternative approximately six kilometres. The alternatives consist partly of existing roads. Construction may be complicated by undulating terrain. The existing road sections will require extensive reconstruction measures, as they currently have insufficient width and lack the load-bearing capacity required for heavy traffic. Upgrading and reconstruction of existing roads, as well as the construction of new roads, will need to be investigated in dialogue with both the Swedish Transport Administration (Trafikverket) and Valdemarsvik Municipality.

Electricity Network

A prerequisite for the facility's operation and electricity production is a connection to the electricity grid. Currently, there are no connection possibilities from the project area to the existing electricity grid. In its application, the company states that, at the facility's full-scale operation, a connection to Svenska kraftnät's transmission network (400 kV), located just over 30 kilometres west of the project area, is considered the most realistic solution. The application has highlighted two alternatives for potential power line routes to connect to the transmission network.

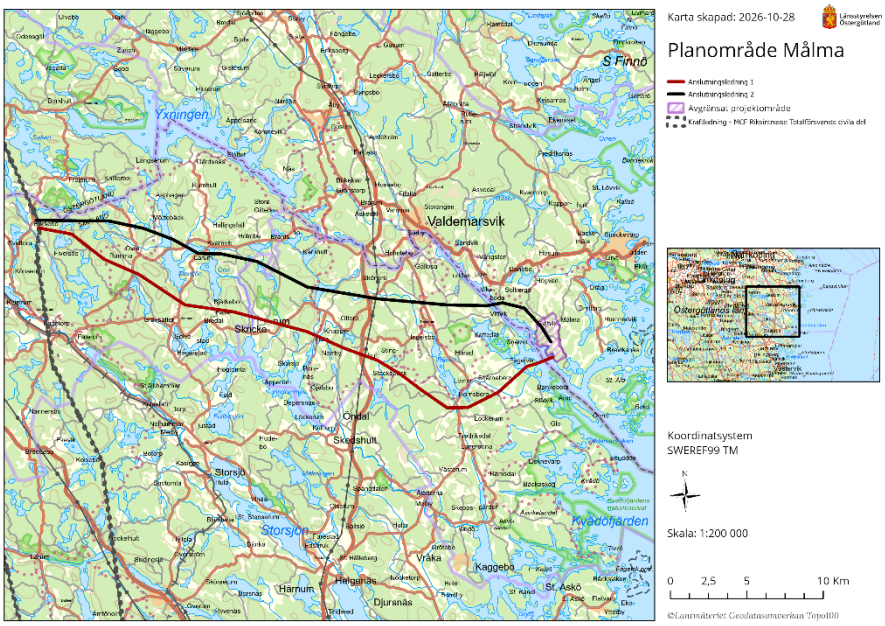


Figure 9. The alternative connecting power lines (red and black lines) proposed in the application to and from the project area (marked with purple hatching) for connection to the existing electricity grid (grey dotted line). *Source: Refirm Målma AB's application for government approval and the County Administrative Board of Östergötland.*

According to the application, both alternatives have been preliminarily identified and chosen based on the principle of following existing infrastructure as far as possible, avoiding densely built-up areas, and passing through land types that, based on experience, are suitable for overhead power line construction.

It is Svenska kraftnät that is responsible for planning, capacity assessment, and deciding on the connection to the transmission network. Regardless of whether one of the two proposed routes above is chosen or if other alternatives become relevant, these will need to be addressed through a permit process for line concession under the Electricity Act (Ellagen, 1997:857).

Shipping

Commercial shipping in Valdemarsviken is limited. The majority of maritime traffic consists instead of small boat traffic. The establishment of a port linked to the facility may potentially increase shipping with larger vessels, which could affect shipping and small boat traffic in the maritime area.

The current fairway does not have the capacity or safety required today. During the scoping consultation (avgränsningssamråd), the Swedish Maritime Administration (Sjöfartsverket) stated that the existing fairway has a maximum draught of 4.8 metres and lacks support for night-time

navigation. To identify the needs of shipping, the area must be hydrographically surveyed, and a fairway investigation (farledsutredning) carried out. For the fairway investigation, it is necessary to clarify the type of vessels, their size, draught, and the anticipated volume of maritime traffic. This must be implemented and addressed in collaboration with the Swedish Maritime Administration (Sjöfartsverket) and the Swedish Transport Agency (Transportstyrelsen).

Port

To reduce the burden on the existing road network during the construction phase, the possibility of transporting heavy, very wide, and long components – such as reactor pressure vessels, generator stators, and other large prefabricated modules – by sea is being investigated. According to the application, the option of constructing a RoRo quay (Roll-on/Roll-off-kaj) adjacent to the potential planning area is under consideration.

A port linked to the facility would, for logistical reasons, provide benefits, particularly during the construction phase for transporting the large quantities of materials needed for, and generated by, the construction both to and from the project area. Maritime transport would also relieve the road network of heavy traffic.

In addition to construction transports, the port could be used during the annual outages, when, among other things, nuclear fuel is replaced. In Sweden, transports of spent nuclear fuel and radioactive waste are carried out by sea using the special vessel M/S Sigrid. M/S Sigrid has certain requirements regarding draught, length, and width that must be met.

Activities in a new port require a port permit (hamntillstånd), for which the Swedish Transport Agency (Transportstyrelsen) is the responsible authority.

In subsequent processes, an alternative could be to investigate the possibility of using existing ports in the surrounding area.

Environmental Quality Standards

In the vicinity of the project area, there are seven surface water bodies (ytvattenförekomster) that are subject to environmental quality standards (miljökvalitetsnormer, MKN), which could be affected by the facility.

Table 2. List of surface water bodies subject to environmental quality standards in connection with the project area. *Source: Refirm Målma AB's application for government approval.*

Name	Water ID	Water Category	Ecological Status	Chemical Status
Inre Valdemarsviken	WA89460639	Coastal	Unsatisfactory	Does not achieve good
Yttre Valdemarsviken	WA32259440	Coastal	Moderate	Does not achieve good
Halsöfjärden	WA39688881	Coastal	Moderate	Does not achieve good
Kvädöfjärden	WA15844442	Coastal	Moderate	Does not achieve good
Högvedssjön	WA81649333	Lake	Poor	Does not achieve good
Hulsjön	WA72665468	Lake	Poor	Does not achieve good
Kvarnbäcken	WA90335292	Watercourse	Moderate	Does not achieve good

The provisions on environmental quality standards (miljökvalitetsnormer) are regulated in Chapter 5 of the Environmental Code (5 kap. miljöbalken) and are therefore not part of the matters to be assessed within the framework of the site plan (anläggningsplan). However, given the decisive importance of environmental quality standards (miljökvalitetsnormer) for the permissibility of activities, it is valuable to obtain, at as early a stage as possible, an indication of whether the nuclear activity (kärnteknisk verksamhet) could result in impermissible impacts on an environmental quality standard (miljökvalitetsnorm).

A public authority or municipality may not permit an activity or measure to commence or be modified if this, despite measures to reduce pollution or disturbances from other activities, causes such increased pollution or disturbance that the water environment deteriorates in an impermissible manner or to an extent that jeopardises the possibility of achieving the status or potential that the water should have according to an environmental quality standard (miljökvalitetsnorm). However, it is difficult to assess the impact on the environmental quality standards (miljökvalitetsnormer) at this early stage, as the impact depends, among

other things, on the choice of cooling technology, solutions for stormwater management, and potential water abstraction for drinking water. These are matters that have not yet been investigated to an extent that would allow a final assessment of the activity's compatibility with the environmental quality standards (miljökvalitetsnormer).

Climate Adaptation

The project area is located within regions that will be affected by the projected sea level rise of 2.7 metres. When constructing the facility and any associated follow-up facilities (följdanläggningar), these will need to be adapted to ensure they can withstand a future higher sea level. Consideration should also be given to the possibility of even higher water levels, up to 3.2 metres under extreme conditions. The facilities will also need to be designed to manage stormwater and heavy rainfall. Additional infrastructure, such as roads and ports, will need to be planned to withstand higher sea levels and manage stormwater and heavy rainfall.

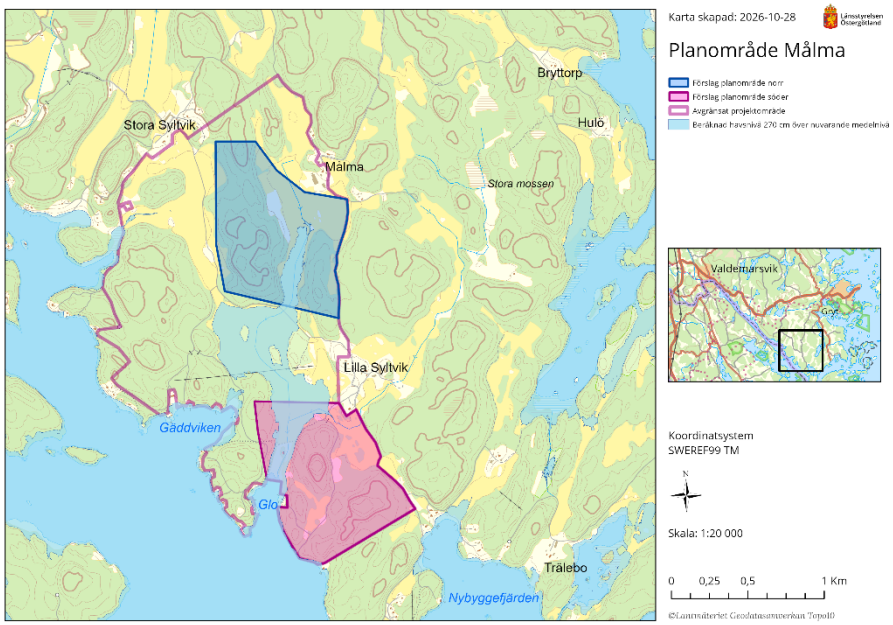


Figure 10. Map showing calculated extreme sea level, 270 cm above the current mean level (light blue marking), within the project area (purple marking). The northern planning area is shown with blue marking and the southern planning area with pink marking. *Source: Refirm Målma AB's application for government approval and the County Administrative Board of Östergötland.*

Existing Plans

Maritime Spatial Plan

The current maritime spatial plan for the Baltic Sea was adopted by the

Government on 10 February 2022. The maritime spatial plan is intended to provide guidance on the use of the areas covered by the plan, with the primary aim of contributing to long-term and sustainable development. The maritime spatial plan overlaps with the municipal comprehensive plan (översiktsplan) through the territorial sea, 22 kilometres from the baseline.

In the current maritime spatial plan, the use outside the present project area is designated for fairways as well as areas for defence, nature, and general purposes. No consideration for the establishment of nuclear power has been taken in the current maritime spatial plan.

Comprehensive Plan (Översiktsplan)

The current comprehensive plan (översiktsplan) for Valdemarsvik Municipality was adopted by the municipal council on 26 March 2018. According to the comprehensive plan, the coastal stretch closest to the project area is classified as contiguous built-up area (sammanhållen bebyggelse). Beyond this, the comprehensive plan does not designate any other new land use (markanspråk) within the area.

Detailed Development Plans (Detaljplaner)

There are no adopted detailed development plans (detaljplaner) or detailed development plans (detaljplaner) under preparation within the project area.

Annexes

- Plan Maps (Plankartor)
- Environmental Impact Assessment (Miljökonsekvensbeskrivning)



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