Curate

XCUR Token (ETH)

SMART CONTRACT AUDIT

06.04.2022

Made in Germany by Chainsulting.de

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1. Disclaimer

The audit makes no statements or warrantees about utility of the code, safety of the code, suitability of the business model, investment advice, endorsement of the platform or its products, regulatory regime for the business model, or any other statements about fitness of the contracts to purpose, or their bug free status. The audit documentation is for discussion purposes only.

The information presented in this report is confidential and privileged. If you are reading this report, you agree to keep it confidential, not to copy, disclose or disseminate without the agreement of Curate Group Ltd. If you are not the intended receptor of this document, remember that any disclosure, copying or dissemination of it is forbidden.

Major Versions / Date	Description
0.1 (28.02.2022)	Layout
0.4 (01.03.2022)	Automated Security Testing Manual Security Testing
0.5 (02.03.2022)	Verify Claims and Test Deployment
0.6 (02.03.2022)	Testing SWC Checks
0.9 (02.03.2022)	Summary and Recommendation
1.0 (03.03.2022)	Final document
1.1 (03.03.2022)	Added deployed contract
1.2 (06.04.2022)	Update Ownership

2. About the Project and Company

Company address:

Curate Group Ltd
50 Eastcastle St
Fitzrovia London
W1W 8EA United Kingdom

Website: https://curate.style

Instagram: https://www.instagram.com/curateproject

Telegram: https://t.me/curate

Twitter: https://twitter.com/curateproject

YouTube: https://www.youtube.com/channel/UCVq646oBKp6CTFUSIHsfKAw

LinkedIn: https://www.linkedin.com/company/cur%CA%8Cte/

TikTok: https://www.tiktok.com/@curateproject

Medium: https://curate-xcur.medium.com

Facebook: https://www.facebook.com/CurateStyle

Coingecko: https://coingecko.com/en/coins/curate

CoinMarketCap: https://coinmarketcap.com/currencies/curate

2.1 Project Overview

Curate is the world's first all-in-one marketplace app that uses blockchain technology as a payment infrastructure and rewards buyers/sellers on all transactions. Curate is built on its native marketplace, allowing buyers and sellers to exchange physical and digital goods such as gaming, electronics, NFTs, clothing, fashion, and more.

Curate utilizes a decentralized blockchain network as a means of providing a reward in the form of $XCUR, our native token, to buyers and sellers on all successful sales. As well as this, Curate offers cryptocurrency payments as an optional form of payment outside traditional options such as credit/debit card and PayPal. Spending XCUR in-app offers zero gas fees as the gas fee amount is credited back to the buyer's wallet in XCUR.

The Curate platform is also rewarding the contributors. Every item or content posted by them will generate some reward for them in digital tokens. This will also serve as a form of motivation for them to sell and buy more on the marketplace.

3. Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 – 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

4. Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

4.1 Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
   i. Review of the specifications, sources, and instructions provided to Chainsulting to make sure we understand the size, scope, and functionality of the smart contract.
   ii. Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
   iii. Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to Chainsulting describe.
2. Testing and automated analysis that includes the following:
   i. Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
   ii. Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

4.2 Tested Contract Files

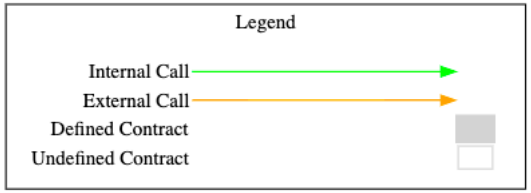
The following are the MD5 hashes of the reviewed files. A file with a different MD5 hash has been modified, intentionally or otherwise, after the security review. You are cautioned that a different MD5 hash could be (but is not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of the review

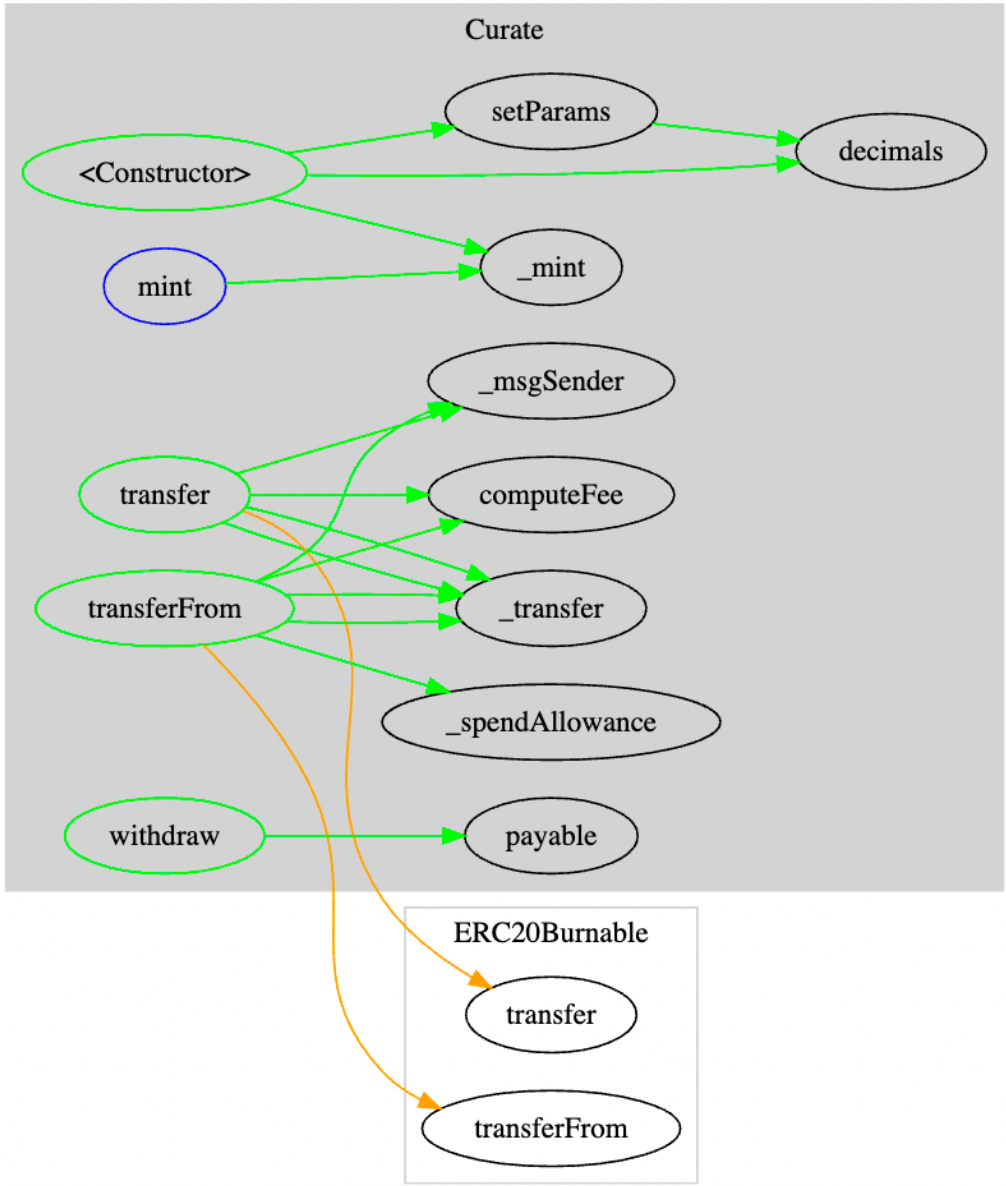
File	Fingerprint (MD5)
XCUR.sol	1f8239a619b51ea5ed0581a4768db193

4.3 Used Code from other Frameworks/Smart Contracts (direct imports)

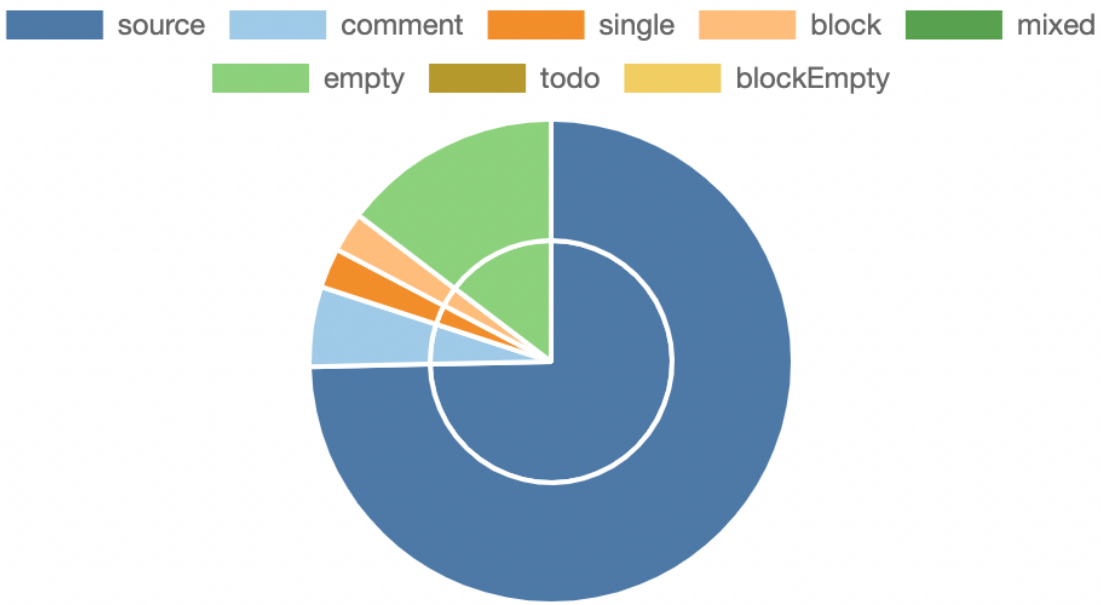
Dependency / Import Path	Source
@openzeppelin/contracts/access/Ownable.sol	https://github.com/OpenZeppelin/openzeppelin-contracts/tree/v4.4.2/contracts/access/Ownable.sol
@openzeppelin/contracts/token/ERC20/extensions/ERC20Burnable.sol	https://github.com/OpenZeppelin/openzeppelin-contracts/tree/v4.4.2/contracts/token/ERC20/extensions/ERC20Burnable.sol

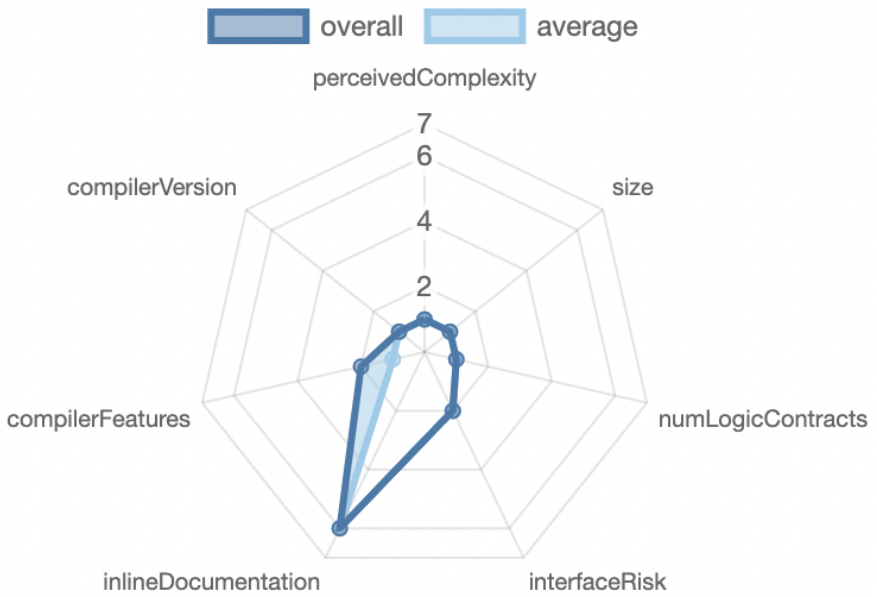
4.4 Metrics / CallGraph





4.5 Metrics / Source Lines & Risk





4.6 Metrics / Capabilities

Solidity Versions observed	🧪 Experimental Features	💰 Can Receive Funds	🖥️ Uses Assembly	💣 Has Destroyable Contracts
`^0.8.9`				

📩 Transfers ETH	⚡ Low-Level Calls	👥 DelegateCall	🧱 Uses Hash Functions	🪚 ECRecover	🌀 New/Create/Create2
`yes`					

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

🌐Public	💰Payable
6	0

External	Internal	Private	Pure	View
1	7	0	0	2

StateVariables

Total	🌐Public
3	3

4.7 Metrics / Source Unites in Scope

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	XCUR.sol	1		71	71	56	4	47	
	Totals	**1**		**71**	**71**	**56**	**4**	**47**	

Legend: [ ]

- **Lines**: total lines of the source unit
- **nLines**: normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
- **nSLOC**: normalized source lines of code (only source-code lines; no comments, no blank lines)
- **Comment Lines**: lines containing single or block comments
- **Complexity Score**: a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

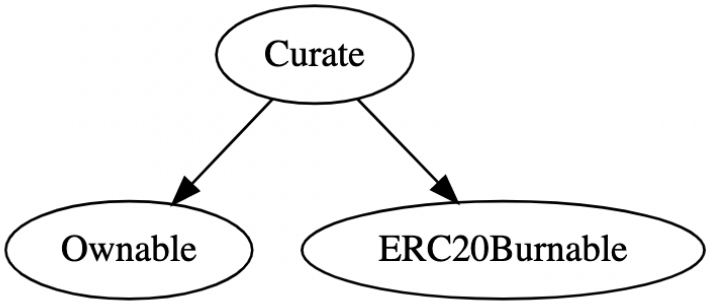
5. Scope of Work

The Curate Team provided us with the file that needs to be tested. The scope of the audit is the XCUR Token contract.

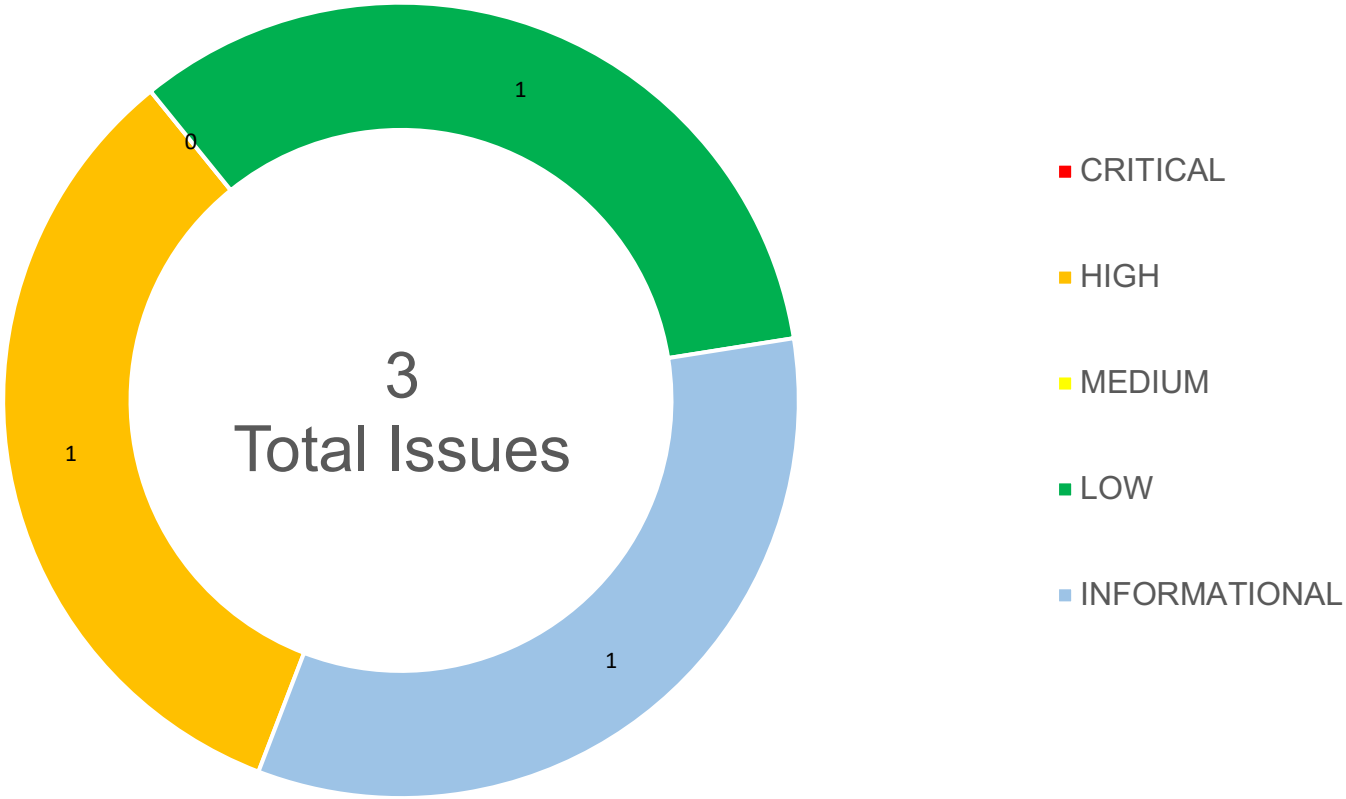
The team put forward the following assumptions regarding the security, usage of the contracts:

- The ERC-20 Token standard is correctly implemented
- Deployer/Owner cannot mint any new Token
- Deployer/Owner cannot burn or lock user funds
- Deployer/Owner cannot pause the contract
- The smart contract is coded according to the newest standards and in a secure way.

The main goal of this audit was to verify these claims. The auditors can provide additional feedback on the code upon the client's request.



5.1 Findings Overview



No	Title	Severity	Status
5.2.1	Extensive Owner rights	HIGH	FIXED
5.2.2	Missing natspec documentation	LOW	ACKNOWLEDGED
5.2.3	Floating pragma is set	INFORMATIONAL	ACKNOWLEDGED

5.2 Manual and Automated Vulnerability Test

CRITICAL ISSUES

During the audit, Chainsulting's experts found **no Critical issues** in the code of the smart contract.

HIGH ISSUES

5.2.1 Extensive Owner rights
Severity: HIGH
Status: FIXED
Code: NA
File(s) affected: XCUR.sol
Update: https://etherscan.io/tx/0xc34eb0e5f6c3a5baf7aaa818327dd7b708045740c736af7d295b65eaf3885c17 Ownership has been transferred to the contract.

Attack / Description	Code Snippet	Result/Recommendation
The owner has extensive rights. The auditor has not recognized any multi-sig structure.	Line: 57 `function mint(uint256 _amount) external onlyOwner` Line: 61	The owner has rights to initiate minting of unlimited tokens and set a tax rate. If the wallet/private key gets into the wrong hands caused by a leak or hack, then it's easily possible to drain out user funds by setting a high fee or mint unlimited tokens and dump on the market. We recommend to protect the owner

	`function setParams(uint256 _newBasisPoints, uint256 _newMaxFee, address _masterAccount) public onlyOwner`	rights with a multi-signature structure such as gnosis safe or hardcode a MaxSupply and MaxFee rate. Update: https://etherscan.io/tx/0xc34eb0e5f6c3a5baf7aaa818327dd7b708045740c736af7d295b65eaf3885c17 Ownership has been transferred to the contract, which means this issue is fixed.

MEDIUM ISSUES

During the audit, Chainsulting's experts found **no Medium issues** in the code of the smart contract

LOW ISSUES

5.2.2 Missing natspec documentation
Severity: LOW
Status: ACKNOWLEDGED
Code: CWE-1056
File(s) affected: XCUR.sol

Attack / Description	Code Snippet	Result/Recommendation
Solidity contracts can use a special form of comments to provide rich documentation for functions, return variables and more. This special form is named the Ethereum Natural	NA	It is recommended to include natspec documentation and follow the doxygen style including @author, @title, @notice, @dev, @param, @return and make it easier to review and understand your smart contract.

Language Specification Format (NatSpec).		

INFORMATIONAL ISSUES

5.2.3 A floating pragma is set.
Severity: INFORMATIONAL
Status: ACKNOWLEDGED
Code: SWC-103
File(s) affected: XCUR.sol

Attack / Description	Code Snippet	Result/Recommendation
The current pragma Solidity directive is "^0.8.9". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.	Line 1: `pragma solidity ^0.8.9;`	It is recommended to follow the latter example, as future compiler versions may handle certain language constructions in a way the developer did not foresee. i.e. Pragma solidity 0.8.9

5.3 SWC Attacks

ID	Title	Relationships	Test Result
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	✅
SWC-130	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	✅
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	✅
SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	✅
SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	✅
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	✅
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	✅
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	✅

ID	Title	Relationships	Test Result
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	✅
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	✅
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	✅
SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	✅
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	✅
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	✅
SWC-116	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	✅
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	✅
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	✅

ID	Title	Relationships	Test Result
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	✅
SWC-112	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	✅
SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	✅
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	✅
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	✅
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	✅
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	✅
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	✅
SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	✅
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	✅

ID	Title	Relationships	Test Result
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	X
SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	✅
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	✅
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	✅

5.4 Verify claims

5.4.1 The ERC-20 Token standard is correctly implemented
Status: tested and verified ✅

5.4.2 Deployer/Owner cannot mint any new Token
Status: tested and verified ✅

```
function mint(uint256 _amount) external onlyOwner {
    _mint(msg.sender, _amount);
  }
```

Update:
https://etherscan.io/tx/0xc34eb0e5f6c3a5baf7aaa818327dd7b708045740c736af7d295b65eaf3885c17 Ownership has been transferred to the contract.

5.4.3 Deployer/Owner cannot burn or lock user funds
Status: tested and verified ✅

5.4.4 Deployer/Owner cannot pause the contract
Status: tested and verified ✅

5.4.5 The smart contract is coded according to the newest standards and in a secure way.
Status: tested and verified ✅

6. Executive Summary

Two (2) independent Chainsulting experts performed an unbiased and isolated audit of the smart contract codebase.

The main goal of the audit was to verify the claims regarding the security of the smart contract and the functions. During the audit, no critical issues were found, after the manual and automated security testing. High, Low and Informational issue have been found.

7. Deployed Smart Contract

VERIFIED

https://etherscan.io/address/0x5dF3801A3E703a3F913cC792A9b451981eD79B02#code

8. About the Auditor

Chainsulting is a professional software development firm based in Germany that provides comprehensive distributed ledger technology (DLT) solutions. Some of their services include blockchain development, smart contract audits and consulting.

Chainsulting conducts code audits on market-leading blockchains such as Hyperledger, Tezos, Ethereum, Binance Smart Chain, and Solana to mitigate risk and instil trust and transparency into the vibrant crypto community. They have also reviewed and secure the smart contracts of 1Inch, POA Network, Unicrypt, Amun, Furucombo among numerous other top DeFi projects.

Chainsulting currently secures $100 billion in user funds locked in multiple DeFi protocols. The team behind the leading audit firm relies on their robust technical know-how in the blockchain sector to deliver top-notch smart contract audit solutions tailored to the clients' evolving business needs.

The blockchain security provider brings the highest security standards to crypto and blockchain platforms, helping to foster growth and transparency within the fast-growing ecosystem.

Check our website for further information: https://chainsulting.de