InterFi NETWORK

SMART CONTRACT AUDIT

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PREPARED FOR

MINEABLE

INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	Mineable
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	0x42b91f1d05afeA671a2dA3c780eDa2aBf0A2A366
Blockchain	Ethereum Chain
Centralization	Active ownership
Commit	fafe97c545b56e2c9ba48b93221f073e1ca405b6
Website	https://mineable.io/
Telegram	https://t.me/mineableofficial/
Twitter	https://twitter.com/mineable_app/
Discord	https://discord.gg/mineable/
Report Date	January 03, 2022

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EXECUTIVE SUMMARY

InterFi has performed the automated and manual analysis of solidity codes. Solidity codes were reviewed for common contract vulnerabilities and centralized exploits. Here's a quick audit summary:

Status	Critical 🔴	Major 🟠	Medium 🟡	Minor 🟢	Unknown 🟤
Open	0	0	1	0	0
Acknowledged	0	0	0	2	0
Resolved	0	0	0	1	0
Noteworthy Privileges	Set Controller, Start Mining, Trigger Mint, Grant/Revoke Role				

ℹ️ Please note that smart contracts deployed on blockchains aren't resistant to exploits, vulnerabilities and/or hacks. Blockchain and cryptography assets utilize new and emerging technologies. These technologies present a high level of ongoing risks. For a detailed understanding of risk severity, source code vulnerability, and audit limitations, kindly review the audit report thoroughly.

ℹ️ Please note that centralization privileges regardless of their inherited risk status - constitute an elevated impact on smart contract safety and security.

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SCOPE OF WORK

InterFi was consulted by Mineable to conduct the smart contract audit of their solidity source codes.

The audit scope of work is strictly limited to mentioned solidity file(s) only:

- Mineable.sol

ℹ️ If source codes are not deployed on the main net, they can be modified or altered before main-net deployment. Verify the contract's deployment status below:

Public Contract Link	
https://etherscan.io/address/0x42b91f1d05afea671a2da3c780eda2abf0a2a366#code	
Contract Name	Mineable
Compiler Version	0.8.7
License	MIT

AUDIT METHODOLOGY

Smart contract audits are conducted using a set of standards and procedures. Mutual collaboration is essential to performing an effective smart contract audit. Here's a brief overview of InterFi's auditing process and methodology:

CONNECT

- The onboarding team gathers source codes, and specifications to make sure we understand the size, and scope of the smart contract audit.

AUDIT

- Automated analysis is performed to identify common contract vulnerabilities. We may use the following third-party frameworks and dependencies to perform the automated analysis:
  - Remix IDE Developer Tool
  - Open Zeppelin Code Analyzer
  - SWC Vulnerabilities Registry
  - DEX Dependencies, e.g., Pancakeswap, Uniswap
- Simulations are performed to identify centralized exploits causing contract and/or trade locks.
- A manual line-by-line analysis is performed to identify contract issues and centralized privileges. We may inspect below mentioned common contract vulnerabilities, and centralized exploits:

Centralized Exploits	○ Token Supply Manipulation ○ Access Control and Authorization ○ Assets Manipulation ○ Ownership Control ○ Liquidity Access ○ Stop and Pause Trading ○ Ownable Library Verification

Common Contract Vulnerabilities	○ Integer Overflow ○ Lack of Arbitrary limits ○ Incorrect Inheritance Order ○ Typographical Errors ○ Requirement Violation ○ Gas Optimization ○ Coding Style Violations ○ Re-entrancy ○ Third-Party Dependencies ○ Potential Sandwich Attacks ○ Irrelevant Codes ○ Divide before multiply ○ Conformance to Solidity Naming Guides ○ Compiler Specific Warnings ○ Language Specific Warnings

REPORT

- The auditing team provides a preliminary report specifying all the checks which have been performed and the findings thereof.
- The client's development team reviews the report and makes amendments to solidity codes.
- The auditing team provides the final comprehensive report with open and unresolved issues.

PUBLISH

- The client may use the audit report internally or disclose it publicly.

ℹ️ It is important to note that there is no pass or fail in the audit, it is recommended to view the audit as an unbiased assessment of the safety of solidity codes.

RISK CATEGORIES

Smart contracts are generally designed to hold, approve, and transfer tokens. This makes them very tempting attack targets. A successful external attack may allow the external attacker to directly exploit. A successful centralization-related exploit may allow the privileged role to directly exploit. All risks which are identified in the audit report are categorized here for the reader to review:

Risk Type	Definition
Critical 🔴	These risks could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
Major 🟠	These risks are hard to exploit but very important to fix, they carry an elevated risk of smart contract manipulation, which can lead to high-risk severity.
Medium 🟡	These risks should be fixed, as they carry an inherent risk of future exploits, and hacks which may or may not impact the smart contract execution. Low-risk re-entrancy-related vulnerabilities should be fixed to deter exploits.
Minor 🟢	These risks do not pose a considerable risk to the contract or those who interact with it. They are code-style violations and deviations from standard practices. They should be highlighted and fixed nonetheless.
Unknown 🟤	These risks pose uncertain severity to the contract or those who interact with it. They should be fixed immediately to mitigate the risk uncertainty.

All statuses which are identified in the audit report are categorized here for the reader to review:

Status Type	Definition
Open	Risks are open.
Acknowledged	Risks are acknowledged, but not fixed.
Resolved	Risks are acknowledged and fixed.

AUTOMATED ANALYSIS

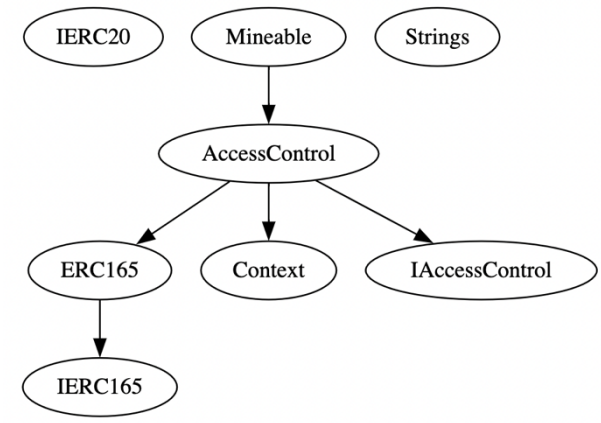
Symbol	Definition
🛑	Function modifies state
💸	Function is payable
🔒	Function is internal
🔐	Function is private
!	Function is important

IERC20	Interface			
└	totalSupply	External !		NO !
└	balanceOf	External !		NO !
└	transfer	External !	🛑	NO !
└	allowance	External !		NO !
└	approve	External !	🛑	NO !
└	transferFrom	External !	🛑	NO !
IERC165	Interface			
└	supportsInterface	External !		NO !
ERC165	Implementation	IERC165		
└	supportsInterface	Public !		NO !
Strings	Library			
└	toString	Internal 🔒		
└	toHexString	Internal 🔒		
└	toHexString	Internal 🔒		
└	toHexString	Internal 🔒		
Context	Implementation			

└	_msgSender	Internal 🔒		
└	_msgData	Internal 🔒		
IAccessControl	Interface			
└	hasRole	External ❗		NO❗
└	getRoleAdmin	External ❗		NO❗
└	grantRole	External ❗	🛑	NO❗
└	revokeRole	External ❗	🛑	NO❗
└	renounceRole	External ❗	🛑	NO❗
AccessControl	Implementation	Context, IAccessControl, ERC165		
└	supportsInterface	Public ❗		NO❗
└	hasRole	Public ❗		NO❗
└	_checkRole	Internal 🔒		
└	_checkRole	Internal 🔒		
└	getRoleAdmin	Public ❗		NO❗
└	grantRole	Public ❗	🛑	onlyRole
└	revokeRole	Public ❗	🛑	onlyRole
└	renounceRole	Public ❗	🛑	NO❗
└	_setupRole	Internal 🔒	🛑	
└	_setRoleAdmin	Internal 🔒	🛑	
└	_grantRole	Internal 🔒	🛑	
└	_revokeRole	Internal 🔒	🛑	
Mineable	Implementation	AccessControl		
└	<Constructor>	Public ❗	🛑	NO❗
└	transfer	Public ❗	🛑	NO❗
└	transferFrom	Public ❗	🛑	NO❗
└	approve	Public ❗	🛑	NO❗
└	increaseAllowance	Public ❗	🛑	NO❗
└	decreaseAllowance	Public ❗	🛑	NO❗
└	_transfer	Internal 🔒	🛑	

└	_approve	Internal 🔒	🛑		
└	_spendAllowance	Internal 🔒	🛑		
└	allowance	Public ❗		NO❗	
└	name	Public ❗		NO❗	
└	symbol	Public ❗		NO❗	
└	decimals	Public ❗		NO❗	
└	totalSupply	Public ❗		NO❗	
└	balanceOf	Public ❗		NO❗	
└	totalCirculationSupply	Public ❗		NO❗	
└	`startMining`	External ❗	🛑		onlyRole
└	`triggerMint`	External ❗	🛑		onlyRole
└	getTriggerInfo	Public ❗		NO❗	
└	`elapsedTime`	Public ❗		NO❗	
└	getBlocks	Public ❗		NO❗	
└	getTime	Public ❗		NO❗	
└	`setController`	External ❗	🛑		onlyRole
└	`rescueFunds`	External ❗	🛑		onlyRole
└	`rescueTokens`	External ❗	🛑		onlyRole
└	<Receive Ether>	External ❗	💵	NO❗	

INHERITANCE GRAPH



MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Access control of Mineable	Medium 🟡
COD-06	Unknown externally owned account	

`onlyRole` access control defined for below mentioned functions:

```
grantRole()
revokeRole()
startMining()
triggerMint()
setController()
rescueFunds()
rescueTokens()
```


`onlyRole` access control:

```
constructor(){

_grantRole(DEFAULT_ADMIN_ROLE, msg.sender);
_grantRole(MINTER_ROLE, minterController);
```


Externally-owned-address (EOA) in contract:

```
address public minterController = address(0x0E0754c25261BB320Dd27835b703b73ED2a53c59);
```

RECOMMENDATION

Authorized roles and EOA keys must be secured carefully, e.g., authorized roles and EOAs can be multi-signature (multi-sig) wallets.

Identifier	Definition	Severity
CEN-02	Initial asset distribution	Minor 🟢

All of the initially minted assets are sent to the contract deployer when deploying the contract.

```
    uint public startSupply = 250_000_000 * 10 ** _decimals;
        _totalSupply = startSupply;
        _balances[msg.sender] = _totalSupply; //starting token
        emit Transfer(address(0), msg.sender, _totalSupply);
```


RECOMMENDATION

Project may communicate with stakeholders while distributing initially minted assets.

RESOLUTION

Mineable initial asset supply is distributed according to the pre-determined tokenomics. Learn more:

https://mineable.gitbook.io/mineable-whitepaper/tokenomics/mnb-distribution

Identifier	Definition
MNB-01	Mint for MNB mining rewards

`MINTER_ROLE` can mint assets using below mentioned functions:

```
startMining()
triggerMint()
```

$MNB starting supply is declared to 250,000,000.

$MNB mineable supply is declared to 1,250,000,000.

```
uint public startSupply = 250_000_000 * 10 ** _decimals;
uint public maxMineableSupply = 1_250_000_000 * 10 ** _decimals;
```


INFORMATION

Block-dependent Mineable deflation process follows a premeditated mint and burn logic. According to Mineable project team, the deflation & constant reward processes of Mineable ecosystem will ensure the sustainability whilst maximizing the long-term potential for Mineable users. Learn more: https://mineable.gitbook.io/mineable-whitepaper/tokenomics/mnb-deflation-process

Identifier	Definition	Severity
COD-04	Missing error messages	

`require` statement should be provided accurate information string in below mentioned function:

`rescueFunds()`

RECOMMENDATION

Provide information strings for `require` related errors.

Identifier	Definition	Severity
COD-07	Conformance to solidity writing guide	

Nomenclature of unsigned integers should be corrected for better code understanding:

```
fd
sr
ddr
elreward
```


RECOMMENDATION

Follow coding conventions for writing solidity code. Learn more:

https://docs.soliditylang.org/en/v0.8.16/style-guide.html

Identifier	Definition	Severity
COD-10	Third Party Dependencies	Minor 🟢

Smart contract is interacting with third party protocols e.g., Uniswap, Open Zeppelin. The scope of the audit treats third party entities as black boxes and assumes their functional correctness. However, in the real world, third parties can be compromised, and exploited. Moreover, upgrades in third parties can create severe impacts, e.g., increased transactional fees, deprecation of previous routers, etc.

RECOMMENDATION

Inspect third party dependencies regularly, and mitigate severe impacts whenever necessary.

Identifier	Definition	Severity
COM-01	Floating compiler status	Minor 🟢

Compiler is set to `^0.8.0`

RECOMMENDATION

Pragma should be fixed to the version that you're indenting to deploy your contracts with.

DISCLAIMERS

InterFi Network provides the easy-to-understand audit of solidity source codes (commonly known as smart contracts).

The smart contract for this particular audit was analyzed for common contract vulnerabilities, and centralization exploits. This audit report makes no statements or warranties on the security of the code. This audit report does not provide any warranty or guarantee regarding the absolute bug-free nature of the smart contract analyzed, nor do they provide any indication of the client's business, business model or legal compliance. This audit report does not extend to the compiler layer, any other areas beyond the programming language, or other programming aspects that could present security risks. Cryptographic tokens are emergent technologies, they carry high levels of technical risks and uncertainty. You agree that your access and/or use, including but not limited to any services, reports, and materials, will be at your sole risk on an as-is, where-is, and as-available basis. This audit report could include false positives, false negatives, and other unpredictable results.

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ABOUT INTERFI NETWORK

InterFi Network provides intelligent blockchain solutions. We provide solidity development, testing, and auditing services. We have developed 150+ solidity codes, audited 1000+ smart contracts, and analyzed 500,000+ code lines. We have worked on major public blockchains e.g., Ethereum, Binance, Cronos, Doge, Polygon, Avalanche, Metis, Fantom, Bitcoin Cash, Velas, Oasis, etc.

InterFi Network is built by engineers, developers, UI experts, and blockchain enthusiasts. Our team currently consists of 4 core members, and 6+ casual contributors.

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SMART CONTRACT AUDITS | SOLIDITY DEVELOPMENT AND TESTING

RELENTLESSLY SECURING PUBLIC AND PRIVATE BLOCKCHAINS