# Smart Contract Security Audit V1

# **Martian Colony Smart Contract**

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business@saferico.com

https://t.me/SFI\_ANN

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# Background

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

# **Project Information**

• Platform: Ethereum

• Contract Address: 0x8fe16B1Bec42Fe2c6795C40b4A2780B2D1b3Dc46

• Code:

https://github.com/Saferico/Smart-Contracts-for-Projects/blob/main/MartianColony.sol

### **NFT Information**

• Name: MC1

• Max Supply: 13444 (Team = 111, presale = 2222, and public mint = 11111)

• Holders:

• Total transactions:

## Contracts address deployed to test net (ETH)

Martian Colony Smart contract on ETH test net to test write functions by the auditor.

https://rinkeby.etherscan.io/address/0x8fe16b1bec42fe2c6795c40b4a2780b2d1b3dc46

## **Executive Summary**

According to our assessment, the customer's solidity smart contract is **Well-Secured**. Because the team fix all low issues.

Well Secured	<b>√</b>
Secured	
Poor Secured	
Insecure	

Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 0 high, 0 medium, 2 low, 0 very low-level issues and 1 note in all solidity files of the contract

The files:

MartianColony.sol

# File and Function Level Report

# File in Scope:

Contract Name	SHA 256 hash	Contract Address
MartianColony.sol	092be57481c968c8b8ee0c1 450e129ae64ac84247b68ed 85e3d5cb8ce667f05d	0x8fe16B1Bec42Fe2c6795C40b4A2780B2D1b 3Dc46

• Contract: MartianColony

• Inherit: ERC721, ERC721Enumerable, ERC721URIStorage, Ownable, AccessControl

• Observation: All passed including security check

• Test Report: passed

• Score: passed

• Conclusion: passed

Function	Test Result	Type / Return Type	Score
name	<b>√</b>	Read / public	Passed
symbol	<b>√</b>	Read / public	Passed
getRoleAdmin	<b>√</b>	Read / public	Passed
supportsInterface	<b>√</b>	Read / public	Passed
DEFAULT_ADMIN_R OLE	✓	Read / public	Passed
balanceOf	<b>√</b>	Read / public	Passed
Owner	<b>√</b>	Read / public	Passed
hasRole	<b>√</b>	Read / public	Passed
manager	<b>√</b>	Read / public	Passed
getApprovedForAll	<b>√</b>	Read / public	Passed
ownerOf	<b>√</b>	Read / public	Passed
getApproved	<b>√</b>	Read / public	Passed

tokenURI	✓	Read / public	Passed
tokenByIndex	<b>√</b>	Read / public	Passed
tokenOfOwnerByIndex	<b>√</b>	Read / public	Passed
Max_Team_Martians	<b>√</b>	Read / public	Passed
Max_Presale_Martians	✓	Read / public	Passed
maxPreSalePurchase	✓	Read / public	Passed
maxTeamPurchase	✓	Read / public	Passed
presaleIsActive	✓	Read / public	Passed
baseURI	✓	Read / public	Passed
Max_Martians	✓	Read / public	Passed
totalSupply	✓	Read / public	Passed
PreMintedSupply	✓	Read / public	Passed
PreSaleList	✓	Read / public	Passed
PresalePrice	✓	Read / public	Passed
SaleIsActive	✓	Read / public	Passed
SalePrice	✓	Read / public	Passed
Team	✓	Read / public	Passed
TeamSupply	✓	Read / public	Passed
grantRole	<b>√</b>	Write / public	Passed
approve	✓	Write / public	Passed
safeTransferFrom	✓	Write / public	Passed
safeTransferFrom	<b>√</b>	Write / public	Passed
giveAway	<b>√</b>	Write / public	Passed
mintForTeam	<b>√</b>	Write / payable	Passed
transferOwnership	<b>√</b>	Write / public	Passed
setApprovalForAll	<b>√</b>	Write / public	Passed
transferFrom	✓	Write / public	Passed

mintMartianPresale	<b>√</b>	Write / payable	Passed
renounceRole	<b>✓</b>	Write / public	Passed
revokeRole	<b>√</b>	Write / public	Passed
renounceOwnership	<b>√</b>	Write / public	Passed
withdraw	<b>√</b>	Write / public	Passed
mintMartian	<b>√</b>	Write / payable	Passed
TogglePreSale	<b>✓</b>	Write / public	Passed
ToggleSale	<b>✓</b>	Write / public	Passed
setSalePrice	<b>√</b>	Write / public	Passed
setPreSalePrice	<b>√</b>	Write / public	Passed
setBaseURI	<b>√</b>	Write / public	Passed

# **Issues Checking Status**

No.	Issue Description	Checking Status
1	Compiler warnings.	Passed
2	Race conditions and Reentrancy. Cross-function race conditions.	Passed
3	Possible delays in data delivery.	Passed
4	Oracle calls.	Passed
5	Design Logic.	Passed
6	Timestamp dependence.	Passed
7	Integer Overflow and Underflow.	Passed
8	DoS with Revert.	Passed
9	DoS with block gas limit.	Passed with notes
10	Methods execution permissions.	Passed
11	Economy model. If application logic is based on an incorrect economic model, the application would not function correctly and participants would incur financial losses.  This type of issue is most often found in bonus rewards systems, Staking and Farming contracts, Vault and Vesting contracts, etc.	
12	The impact of the exchange rate on the logic.	Passed
13	Private user data leaks. Passed	
14	Malicious Event log. Passed	
15	Scoping and Declarations.	Passed
16	Uninitialized storage pointers.	Passed
17	Arithmetic accuracy. Passed	

# Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

## **Audit Findings**

#### **Critical:**

No Critical severity vulnerabilities were found.

#### **High:**

No High severity vulnerabilities were found.

#### Medium:

No Medium severity vulnerabilities were found

#### Low:

#Missing zero address validation

#### Description

When the owner wants to give away for the investors it has to check for the zero address to make, he didn't mint for the burn address. Otherwise, the mint function will act like the burn function.

```
function giveAway(address _to, uint256 numberOfTokens) external onlyRole(Manager) {
    uint256 supply = totalSupply();
    // Ensure conditions are met before proceeding
    require(numberOfTokens > 0, "Need to mint at least 1 NFT");
    require(supply + numberOfTokens <= Max_Martians, "Purchase would exceed max
supply of Martians");

    for (uint32 i; i < numberOfTokens; i++) {
        _safeMint(_to, supply + i);
    }
}</pre>
```

#### Remediation

Use a require statement to check for zero address when give away NFT to any address.

Status: Closed. Fixed in version 2.

#### #Pragam version not fixed

#### Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.7 instead of ^0.8.0). contracts should be deployed with the same compiler version and flags that they have been tested the most with. Locking the pragma helps ensure that contracts do not accidentally get deployed using, for example, the latest compiler which may have higher risks of undiscovered bugs. Contracts may also be deployed by others and the pragma indicates the compiler version intended by the original authors.

#### Remediation

Remove the ^ sign to lock the pragma version.

Status: Closed. Fixed in version2

### **Very Low:**

No Very Low severity vulnerabilities were found.

**Notes:** 

### #Unnecessary import of ERC721 library

#### Description

The main contract inherits: ERC721, ERC721Enumerable, ERC721URIStorage, Ownable, AccessControl, ERC721Enumerable which is already import ERC721 library, so no need to import it again in the main contract.

#### Remediation

Remove unnecessary library from the main contract save some gas fees.

Status: Closed. Fixed in version2.

# **Automatic Testing**

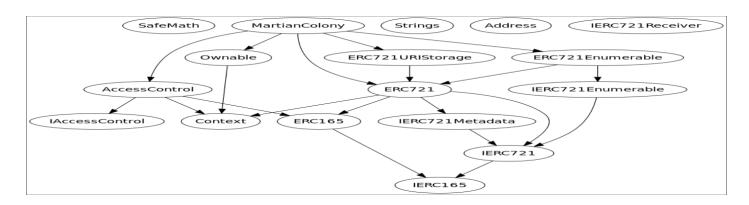
## 1- Check for security



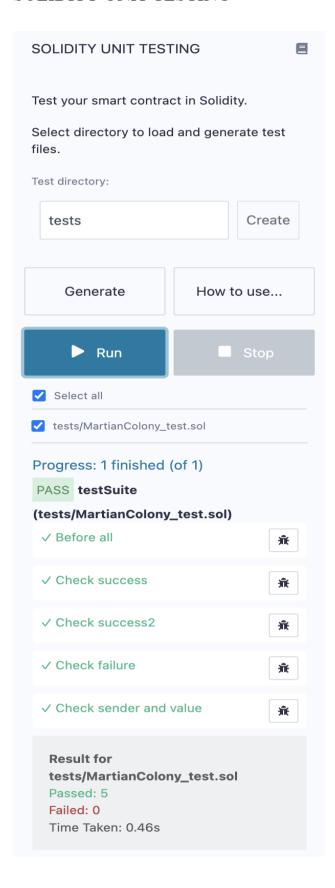
#### 2- SOLIDITY STATIC ANALYSIS



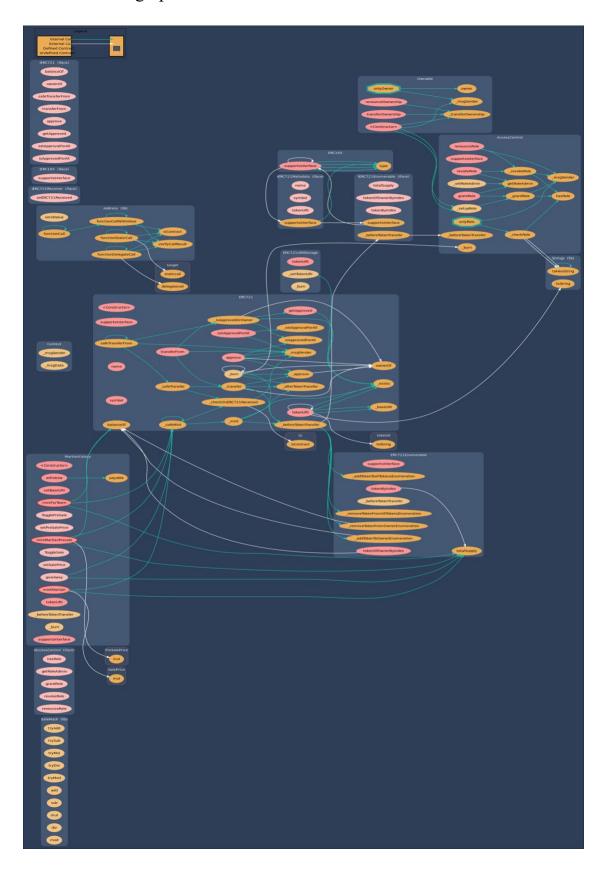
# 3- Inheritance graph



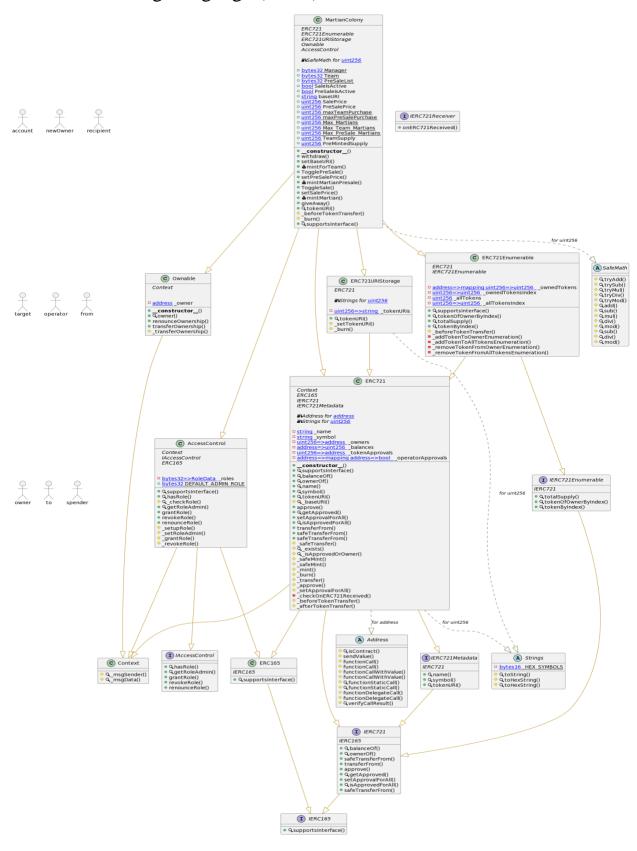
#### 4- SOLIDITY UNIT TESTING



# 5- Call graph



# Unified Modeling Language (UML)



## Functions signature

```
Sighash | Function Signature
_____
16279055 => isContract(address)
884557bf => tryAdd(uint256, uint256)
a29962b1 => trySub(uint256,uint256)
6281efa4 => tryMul(uint256, uint256)
736ecb18 => tryDiv(uint256,uint256)
38dc0867 => tryMod(uint256, uint256)
771602f7 => add(uint256,uint256)
b67d77c5 => sub(uint256, uint256)
c8a4ac9c => mul(uint256, uint256)
a391c15b => div(uint256, uint256)
f43f523a => mod(uint256,uint256)
e31bdc0a => sub(uint256,uint256,string)
b745d336 => div(uint256, uint256, string)
71af23e8 => mod(uint256, uint256, string)
91d14854 => hasRole(bytes32,address)
248a9ca3 => getRoleAdmin(bytes32)
2f2ff15d => grantRole(bytes32,address)
d547741f => revokeRole(bytes32,address)
36568abe => renounceRole(bytes32,address)
6900a3ae => toString(uint256)
8fba8d5c => toHexString(uint256)
63e1cbea => toHexString(uint256,uint256)
119df25f => _msgSender()
8b49d47e => _msgData()
8da5cb5b => owner()
715018a6 => renounceOwnership()
f2fde38b => transferOwnership(address)
d29d44ee => _transferOwnership(address)
24a084df => sendValue(address,uint256)
a0b5ffb0 => functionCall(address, bytes)
241b5886 => functionCall(address,bytes,string)
2a011594 => functionCallWithValue(address, bytes, uint256)
d525ab8a => functionCallWithValue(address, bytes, uint256, string)
c21d36f3 => functionStaticCall(address, bytes)
dbc40fb9 => functionStaticCall(address, bytes, string)
ee33b7e2 => functionDelegateCall(address,bytes)
57387df0 => functionDelegateCall(address,bytes,string)
946b5793 => verifyCallResult(bool, bytes, string)
150b7a02 => onERC721Received(address,address,uint256,bytes)
01ffc9a7 => supportsInterface(bytes4)
c2985578 => foo()
5b7b2c38 => checkRole(bytes32,address)
4fa943a6 => setupRole(bytes32,address)
7612997d => setRoleAdmin(bytes32,bytes32)
ce2cc1d0 => grantRole(bytes32,address)
2c95bd23 => revokeRole(bytes32,address)
70a08231 => balanceOf(address)
6352211e => ownerOf(uint256)
42842e0e => safeTransferFrom(address,address,uint256)
23b872dd => transferFrom(address,address,uint256)
095ea7b3 => approve(address, uint256)
```

```
081812fc => getApproved(uint256)
 a22cb465 => setApprovalForAll(address, bool)
 e985e9c5 => isApprovedForAll(address,address)
b88d4fde => safeTransferFrom(address,address,uint256,bytes)
 18160ddd => totalSupply()
 2f745c59 => tokenOfOwnerByIndex(address,uint256)
 4f6ccce7 => tokenByIndex(uint256)
 06fdde03 => name()
 95d89b41 => symbol()
 c87b56dd => tokenURI (uint256)
743976a0 => baseURI()
24b6b8c0 => safeTransfer(address, address, uint256, bytes)
f8e76cc0 => exists(uint256)
4cdc9549 => isApprovedOrOwner(address, uint256)
b3elc718 => safeMint(address, uint256)
6a4f832b => safeMint(address, uint256, bytes)
4e6ec247 => mint(address, uint256)
9b1f9e74 => burn(uint256)
30e0789e => transfer(address, address, uint256)
7b7d7225 => approve(address, uint256)
8c4e3f32 => setApprovalForAll(address, address, bool)
1fd01del => checkOnERC721Received(address, address, uint256, bytes)
cad3be83 => beforeTokenTransfer(address, address, uint256)
8f811a1c => afterTokenTransfer(address, address, uint256)
01538868 => setTokenURI(uint256, string)
69025b5f => addTokenToOwnerEnumeration(address, uint256)
e03d890b => addTokenToAllTokensEnumeration(uint256)
68df0d53 => removeTokenFromOwnerEnumeration(address, uint256)
 743976a0 \Rightarrow baseURI()
68df0d53 => _removeTokenFromOwnerEnumeration(address,uint256)
4cbb4a0a => _removeTokenFromAllTokensEnumeration(uint256)
 3ccfd60b => withdraw()
 55f804b3 => setBaseURI(string)
 5a4d448a => mintForTeam(uint256)
 bf82e07b => TogglePreSale()
 7d7eee42 => setPreSalePrice(uint256)
 c9bab860 => mintMartianPresale(uint256)
885c95da => ToggleSale()
 1919fed7 => setSalePrice(uint256)
 9d34b0dd => mintMartian(uint256)
 ca800144 => giveAway(address, uint256)
```

## Automatic general report

```
Files Description Table
| File Name | SHA-1 Hash |
|-----|
| /Users/macbook/Desktop/smart contracts/MartianColony.sol |
22d5ba8685b8bcf249e81483574279cd6d4615c3 |
Contracts Description Table
| Contract |
                 Type Bases
| **Function Name** | **Visibility** | **Mutability** |
**Modifiers** |
| **SafeMath** | Library | ||| | |
| L | tryMul | Internal A |
| L | tryMod | Internal 🖺 | | |
| L | add | Internal A | | |
| L | sub | Internal A | | L | mul | Internal A |
| L | div | Internal A |
| L | mod | Internal A |
| L | sub | Internal A |
 L | div | Internal 🖺 |
| L | mod | Internal A | | | | | | |
| **IAccessControl** | Interface | ||
| L | hasRole | External | | NO | |
| L | getRoleAdmin | External | | | NO | |
| L | grantRole | External [ | O | NO[ |
| L | revokeRole | External | | NO | |
| **Strings** | Library | |||
| L | toString | Internal A |
| L | toHexString | Internal 🖺 | | |
| L | toHexString | Internal A | | |
| **Context** | Implementation | |||
| L | _msgSender | Internal 🖺 | | |
| L | msgData | Internal 🖺 | | |
| **Ownable** | Implementation | Context | | |
| L | <Constructor> | Public | |  
| L | owner | Public | | NO | |
| L | renounceOwnership | Public | | OnlyOwner | L | transferOwnership | Public | OnlyOwner |
```

```
| L | transferOwnership | Internal 🖺 | 🔘 | |
| L | sendValue | Internal A | O | |
| L | functionCall | Internal 🖺 | 🔘
| L | functionCall | Internal A |
| L | functionCallWithValue | Internal
| L | functionStaticCall | Internal A | L | functionStaticCall | Internal A |
| L | functionDelegateCall | Internal 🖺
| L | functionDelegateCall | Internal
| L | verifyCallResult | Internal 🖺 | | | |
| **IERC721Receiver** | Interface | |||
| L | onERC721Received | External | |
| **IERC165** | Interface | |||
| L | supportsInterface | External | | NO| |
| **ERC165** | Implementation | IERC165 |||
| L | supportsInterface | Public | | NO | |
| **AccessControl** | Implementation | Context, IAccessControl, ERC165 | | |
| L | supportsInterface | Public | | NO | |
| L | hasRole | Public | | NO | |
| NO
| L | grantRole | Public | | OnlyRole | L | revokeRole | Public | OnlyRole |
| L | renounceRole | Public | | NO | |
| L | setupRole | Internal 🖺 | 🔘 | |
| L | grantRole | Internal 🖺 | 🔘 | |
| L | revokeRole | Internal 🖰 | 🔘 | |
| **IERC721** | Interface | IERC165 |||
| L | balanceOf | External | | NO | |
| L | transferFrom | External | | ● |
| L | getApproved | External | | NO | |
 L | setApprovalForAll | External | | NO | |
| L | isApprovedForAll | External | | NO | | |
| **IERC721Enumerable** | Interface | IERC721 |||
| L | totalSupply | External | | NO | |
| L | tokenOfOwnerByIndex | External | | | NO | |
| L | tokenByIndex | External | | | NO| |
| **IERC721Metadata** | Interface | IERC721 |||
| L | name | External | | | NO | |
```

```
| L | symbol | External | | | NO | |
| L | tokenURI | External | | NO | |
| **ERC721** | Implementation | Context, ERC165, IERC721, IERC721Metadata |||
| L | <Constructor> | Public | | | NO | |
 | supportsInterface | Public | |
 L | balanceOf | Public | | NO | |
 L | ownerOf | Public | | NO | |
 L | symbol | Public | |
                   | NO
 L | tokenURI | Public | |
                     |NO∭ |
 L | getApproved | Public | | NO | |
 L | transferFrom | Public | | (
                           | NON |
 L | safeTransferFrom | Public | | ●
                              |NON |
 |NO|
 L | _safeTransfer | Internal 🖺 | 🗓
                              L | _exists | Internal 🖺 | | |
 L | isApprovedOrOwner | Internal 🖺 |
 L | safeMint | Internal 🗎 | 🔘 | |
 L | mint | Internal 🖰 |
                      setApprovalForAll | Internal 🖺 |
 L | _checkOnERC721Received | Private A | _ |
 L | beforeTokenTransfer | Internal 🖺 | 🔘 | |
| L | afterTokenTransfer | Internal 🖺 | 🔘 | | |
| **ERC721URIStorage** | Implementation | ERC721 |||
| L | tokenURI | Public | | NO | |
| L | setTokenURI | Internal A | O
| L | _burn | Internal A | O | |
| **ERC721Enumerable** | Implementation | ERC721, IERC721Enumerable | | |
| L | supportsInterface | Public | | NO|
 L | tokenOfOwnerByIndex | Public | | NO | |
| L | totalSupply | Public | | NO | |
| L | tokenByIndex | Public | | NO
 L | beforeTokenTransfer | Internal 🖺 | 🔘 | |
| L | addTokenToOwnerEnumeration | Private 🖺 | 🔘
| L | addTokenToAllTokensEnumeration | Private 🖺 | 🔘
 | L | removeTokenFromAllTokensEnumeration | Private 🔓 | 🔘 | |
| **MartianColony** | Implementation | ERC721, ERC721Enumerable, ERC721URIStorage,
Ownable, AccessControl | | |
| L | <Constructor> | Public | | | | ERC721 |
| L | withdraw | Public [ ] _ | onlyOwner |
| L | setBaseURI | Public | | | onlyRole |
| L | mintForTeam | Public | | III | NO | |
```

# Conclusion

The contracts are written systematically. Team found no critical issues. So, it is good to go for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan Everything.

Security state of the reviewed contract is "Well-secured".

- ✓ No volatile code.
- ✓ Not many high severity issues were found.

## Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. team go into more detail on this in the below disclaimer below – please make sure to read it in full.

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